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RADIO CONTROL

47380

car action

THE WORLD'S LEADING RC CAR MAGAZINE

EXCLUSIVE!

Mugen's Tour de Force MTX-2



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Nitro Quake
MRC/Academy
STR-4
TTR
EB-4
Yokomo
MR-4 Pro

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ON THE COVER: Mugen's new nitro touring hot-rod, the MTX-2, wearing a Pro-Line Honda Accord shell with paint by Greg Vogel (photos by Walter Sidas).

Hit the Dirt!

About this time of year, our thoughts turn to outdoor, off-road excitement and all the fun that begins where the pavement ends. Are you ready for big-air jumps, dusty roosts and dirt-slinging donuts? Hey, we're with you, and this month, we've packed the pages with all kinds of new off-road kits and plenty of ground-pounding action.

Senior west coast editor George Gonzalez has been busy churning up some dirt of his own with his latest creation, a **Project: Team Losi NXT** that's a virtual NXT hop-up shopping mall on wheels. It has to be the most impressive custom race truck ever seen in *Radio Control Car Action*—and we've seen some trick trucks.



If you're still shopping for an off-road machine and you're thinking "nitro" and "monster truck," be sure to check out our review of the latest, largest RTR: the **DuraTrax Nitro Quake**. This big rig is ready for action right out of the box, and it combines .21 power and plush 1/8-scale buggy suspension with a look that's pure monster truck.



If your truck has a need for fresh rubber, you will definitely enjoy the **2.2 Truck Tire Guide**. With over 40 treads listed—covering everything from paddle tires to slicks—there's sure to be a perfect tire for your track or backyard. We've even included mounting tips and a mini guide to 2.2 truck rims, so there's no shortage of cool new rolling stock for your favorite flatbed.



Ever wanted to hit the track while wearing your pajamas at two in the morning on a Tuesday? Now you can—without anyone thinking you're weird—with **DuraTrax Real Race**. I tested this hot new driving sim, and it's just like racing a real RC car, minus having to drive to the track, set up the pit table and carry the toolbox! No matter which kind of RC you're into, you'll want to check out *Real Race*.



Vote and win! You'll find a ballot for our annual "Readers' Choice Awards" in this issue. Be sure to fill it out and send it in! You can vote by fax or email, too; the details are on the ballot. This is your chance to let us know which cars, trucks and accessories are your favorites. You could even win your pick for favorite car or truck! But you can't be heard and you can't win unless you vote. So vote!

Until next month

Peter Vieira

Peter Vieira
Executive editor

RADIO CONTROL car action

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"4x4" Fans

Congratulations and thanks for "4x4," which I think is a long-needed section in your magazine. With the popularity of RC monster trucks, it is extremely helpful to get information on and opinions about what does and doesn't work before dropping big cash on hop-ups. [email]
DANIEL MCGUIRE



Thanks for creating the "4x4" column. RC monster trucks are really sweet, and I love them. [email]
MATT WESSELS

"4x4" is awesome! I hope it will be a regular part of the magazine. Clod Busters rule! [email]
JOSH MCGOVERN

To Josh, Matt, Dan and the others who wrote in: thanks for all your support! I appreciate the time you took to write, and I'll try to include as many of your questions and ideas in "4x4" as I can. Thanks again.
—Kevin

Bad News Bear

I have a major "bear" problem. I need help finding replacement parts for my Big Bear RC truck. I bought the truck 14 years ago, and I have been an avid RC'er ever since. Even though the truck is really old and out-of-date, I don't want to put it on the shelf. I have logged onto many online hobby-store sites and have found nothing. I was told that Tamiya made my truck, but that proved to be incorrect. I think the manufacturer was Tokyo Marui Plastic Model, but I cannot find the com-

pany anywhere. I need your help to save the Bear. You're my last chance before it is extinct. I need an idler gear and a bevel-gear assembly. If you or anyone at the best mag in the west can help, I would be very grateful (and so would Smokey).
J.C. EVANS
Pahrump, NV

Yes, J.C., Marui made the legendary Big Bear. Although you might get lucky by scouring the discount bins of local hobby shops, I think your fellow *Radio Control Car Action* readers will be your best source. If anyone out there has parts for J.C.'s old timer, you can email him at jcnshay@earthlink.com.
—Pete

Not Ready For Ready-to-Run

It seems that most RC cars are now available ready-to-run—even the high-end RC10GT. To me, this is a very disturbing trend. I learned so much as a kid from building and repairing RC cars. I was always so proud of myself after spending hours putting a car together; it gave me the ability to fix a car when something broke and helped to develop my creativity and problem-solving skills. With cars becoming available ready-to-run only, the challenge and fun of putting it together yourself is removed. Kids these days will be missing out on the joy and satisfaction of putting an RC car together. Is this a trend that will reverse, or in the future when I buy a new top-of-the-line car, will it already be built for me?
RYAN VASEY
Palatine, IL

I think you're missing the point of RTRs, Ryan. Rather than depriving hobbyists of the building experience, RTRs attract many would-be RCers who might hesitate to purchase a kit for fear of not knowing how to assemble it (or simply not wanting to assemble it). If having the kit assembled in the box and even painted makes the difference between a person taking up our hobby and just daydreaming about it, that's great for all of us. As for those of us who prefer to

build our own stuff, I have no doubt the option will always be there, but you are correct in your prediction that top-shelf racing gear will go RTR. Even now, Mugen is planning to offer the world-class MBX-4 as a RTR with pro-quality KO servos and a Mars radio. We'll see how it goes!
—Pete

Track Care Qs

I have a few questions concerning off-road track maintenance. My friends and I built a track (we took pictures for "Chris's Back Lot"; don't worry, Mr. Chianelli), but we have had some problems since finishing it. When it rains, the track floods because drainage is poor. We have tried some ideas, but are now stumped. Also, the jump faces fall apart when it rains—especially this monster double that we built that is 6 to 8 feet long. My RC10B3 can clear it, but the other guys' cars can't. They never come close to clearing it and usually pile into the front side of the second jump. This means we have to rebuild the jump often, and the rain doesn't help. I pack the jumps down with my feet. I weigh about 150 pounds. Is this enough force to pack the jumps well? It's annoying to get to the track at 10 a.m. to work on it and not be able to drive until around 2 or 3 o'clock. Any help will be greatly appreciated. [email]
JASON SINCLAIR

Mr. Chianelli? Who are you writing to—my Dad?

Jason, I'm psyched that you guys took the time to build a track rather than just whining about not having one. That's awesome. Now, let's talk track. You're heavy enough to pack the jumps well, but feet aren't the best tool. Once you've done your stomping, add a few dozen whacks with the bottom of a flat shovel blade. If your jumps are crumbling because they're made of "soft" dirt, place a strip of discarded carpet on the face of the jump and over the lip. This will also help to prevent rain damage. You should also fill in any low spots on the track, so they won't turn into potholes, and tell your friends not to bother attempting the doubles if they

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

EMAIL ADDRESSES:

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George Gonzalez: georgeg@airage.com
Kevin Hetmansk: kevinh@airage.com
Steve Pond: stevep@airage.com
Peter Vieira: peter@airage.com
Greg Vogel: gregv@airage.com

don't have the horsepower. If their trucks can't clear the dubs at full tilt with a fresh pack, they never will (not until they get hotter motors, anyway).

Even using these tips, you'll have to devote a fair chunk of time to track maintenance; it's just a fact of off-road life. Make sure your friends help you out!
—Chris

Big Buggy

Quick question: has *Radio Control Car Action* ever done an article on the Traxxas 1/6-scale buggy? I purchased one this weekend and I'm interested to see what you guys think of it. Will you review it if you haven't yet? It would make a great article. [email]
DUFFY SLADE

Duffy Slade? Where was I when they handed out the cool names? You could be a guy in the Beastie Boys' "Sabotage" video. Or Magnum PI's best friend. Or a character played by the guest star on "Starsky and Hutch." Oh yeah, your question. We reviewed the Traxxas 1/6-scale machine in the June '94 issue; you can order a copy from Kable News by calling (800) 877-5169. Coincidentally, on the way back from lunch the other day, I saw a guy pounding around a baseball diamond with one of those behemoth buggies. I'm sure you're having fun—that thing is awesome!
—Pete



BY CHRIS
CHIANELLI

My New Favorite Rally Car! Lancia Stratos Landmax

Rally cars seem to be on the rise again, and enthusiasts are sure to like this one. It's Kyosho's newest addition to its 1/8-scale, 21 glow-powered Landmax Series. Sixty-percent pre-assembled, the Lancia should be ready for action in just a few evenings. Features include mud guards, special rally wheels and tires and 10 ball bearings inside the three diffs. Rally terrain muscle is provided by the included Kyosho GS-R 21 engine with recoil starter. Specs: length—22 inches; width—9.8 inches; and wheelbase—12.8 inches.

Great Planes Distributors, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-0008.



NOW EVEN BRAINIER!

According to MRC, advanced design and high-quality components give the Super Brain 819 charger a number of advantages over other chargers. First, it can continuously and more accurately read the condition of a battery during the fast charge cycle without having to pause periodically to detect delta peak. In this way, it is able to fully charge the battery much faster while avoiding overcharging. This smoother charging process helps ensure that the battery has a longer run time, is conditioned properly and lasts longer. Both battery and charger remain much cooler during the charging process. This improved heat management allows the 819 SuperBrain to be used all day.

Operation of the 819 is very simple; it's completely automatic. The patent-pending Micro Peak Detection technology continuously monitors the status of the battery, thereby ensuring linear and uninterrupted fast charge. A safety timer will stop the fast charge after 40 minutes if a delta peak is not detected. A trickle-charge pilot light will blink after the quick charge has been completed, and if the unit is left unattended for more than 120 minutes, it will automatically shut off.

Model Rectifier Corp. (MRC), 80 Newfield Ave., P.O. Box, Edison, NJ 08818; (732) 225-2100; fax (732) 225-0091.



OFNA has some good racing sedans, but we've always been hard on the tires they include, which are usually strictly for play. No more! OFNA now has sticky, belted racing slicks.

Race-Ready Rubber From OFNA BELTED TIRES AND DISH RIMS

Ideal for operating entry-level cars, Futaba's new, 2ER, 2-stick, digitally proportional AM system replaces the 2DR and features a stylish new case. The radio's fine trims are easily accessible on the front

Stick It To 'Em

panel for convenience, and the short sticks allow for full range of movement when operated by smaller hands. The 2ER also includes servo reversing, two S3003 servos and a R122JE receiver.

Great Planes Distributors, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-0008.



FUTABA 2ER AM RADIO SET



Best known for super-tough pan-car axles, IRS now offers lightweight differential halves for the Associated TC3. The parts are machined from 7005 aluminum (hard stuff!) and are hard-anodized for additional wear resistance. The IRS diff parts are much lighter than the stock, steel pieces. Also shown are IRS Stealth diff rings, which are recommended (but not required) for use with the lightweight diffs.

IRS Weight Audit!

Irrgang Racing Service
Litedrives for Associated TC3



Dynamite's Ni-Charge and Glow Driver

Here's a convenient way to keep those glow drivers up to full charge in your workshop. These units feature durable anodized aluminum cases, sure-lock glow-plug attachments and contoured, comfort-grip finger clips. Glow-driver units are also available for dry cells in either "C" or "D" cell versions.

Horizon Hobby Distributors Inc.,
4105 Fieldstone Rd.,
Champaign, IL
61822; (217)
355-9511.



BOLINK TORKER

If you're a serious racer and like doing precision work, Bolink's BL 7615 Torker 4-40 tap set should be in your workshop. This kit includes an aluminum T-handle, 4-40 tap and no. 43 drill bit in a handy clamshell box. Great for drilling and tapping in most materials, or re-tapping damaged threads. Price is only \$9.99.

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30045; (770) 963-0252; fax (770) 963-7334; www.bolink.com.

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TEAM Kinwold TRINITY



POWER and GOOD LOOKS: **DuraTrax**



DuraTrax now offers Panasonic 3000 NiMH (nickel-metal-hydride) in 6-cell flat, 7-cell flat and 7-cell hump packs. These packs retain the usual DuraTrax features such as shotgun tubes, quad-welding on each tab/cell connection and 14-gauge, super-flex silicone wire. Also shown are color-anodized chassis for the Maximum series trucks and buggy; DuraTrax also offers a ton of machined aluminum hop-up parts for the line.

Great Planes Distributors, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300;

fax (217) 398-0008.

REEDY'S MILLENNIUM WIND

There's been much talk about the new NiMH (nickel-metal-hydride) cells and how to charge and use them properly so their benefits can be fully realized. Well, Reedy has introduced its new Fury MW (millennium wind) series of motors; they are the first motors created specifically to maximize the power that the new 3000 NiMH cells have to offer. These triple-wind armatures use a single large strand combined with two smaller strands to give the best of both worlds, that being the high torque and power of a double-wind, plus the smoothness and efficiency of quad/quint winds. Just ask Billy Easton, 1999 International Scale Touring Car World Cup Champion; his winning TC3 was equipped with Reedy's Fury MW wind motor and Reedy R3K 3000 NiMH cells.



TEAM **Kinwald** 2000

*Losi Dual Slipper Spurs
In 92, 96, 98 & 100 Tooth*

*Associated Style Spurs
In 96, 98, & 100 Tooth*

*BK Steel Pinions In
15 To 31 Tooth*

*Fits Cars Which Use
The Following 48 &
64 Pitch Gear Sizes*

48 P 64 P BK Pitch
78 Or 105 Use 92 Tooth
82 Or 110 Use 96 Tooth
84 Or 112 Use 98 Tooth
86 Or 114 Use 100 Tooth

*More Efficient Than 48 Pitch
Stronger Than 64 Pitch*

*Precision Machined
Teeth For A Truer
Better Meshing
Spur Gear*

*New Super Strong
Low Friction, Self
Lubricating Material*

*Long Wear "Hard Ones"
Style Precision Machined
Steel Pinions With Heavy
Duty 5/40 Set Screws*

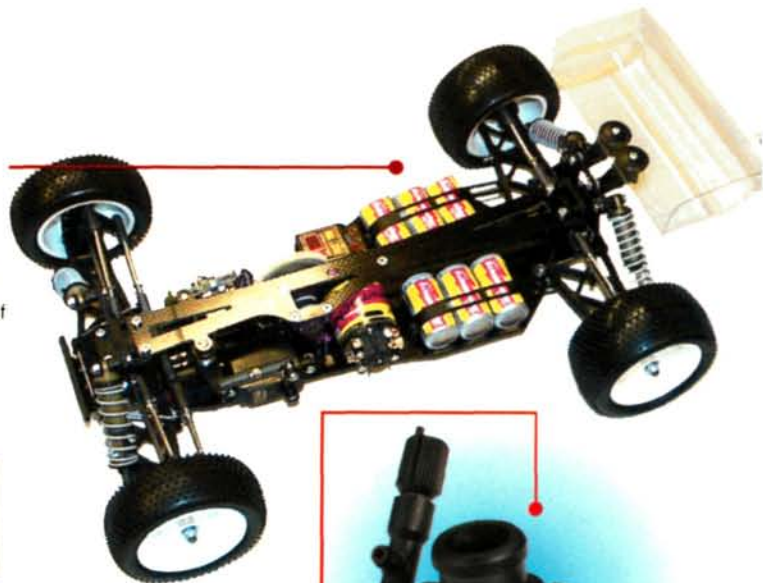
Pinions - \$4.99, Spurs - \$5.99

gear UP FOR 2000 WITH BK PITCH

DA BOMB

CAT Gets caught in a spy shot

Here's the first picture of an early Schumacher CAT 3000 prototype showing a totally new layout. The motor is positioned near the central axis of the car (just as in the successful SST Axis Pro). At present, Schumacher is keeping the body style of the new buggy under wraps.



AIRTRONICS'

RIVAL REPLACEMENT

Not much info on this, but judging by the photo, Airtronics' Blazer will include the usual Rival features (servo reversing and trims, LED battery meter) in this futuristic case.



INFERNO FIX

You might recall the overheating problems we encountered with the Kyosho Inferno MP-6 Sports we tested in the January issue. Since that review, Kyosho has traced the problems to the carburetors of certain kit lots and has since replaced these carbs. According to Great Planes, Kyosho's distributor, any kit that could have had overheating problems was outfitted with new parts before being shipped, so any MP-6 Sports you see on your dealer's shelf (or have already purchased) should be A-OK.



HPI Goes Full-Scale

HPI recently set up a racing exhibition at the National Import Racing Association (NIRA) finals at Firebird Raceway in Phoenix, AZ. According to HPI's general manager, Shawn Ireland, the crew was there to inform and educate import racers about the sport of RC, and a fleet of HPI's RS4 nitro touring cars was on hand for test-drives. Given HPI's wide range of hot import bodies and the high performance of the RS4 sedans, I'm sure a lot of the import guys found themselves hooked on a new hobby before the day was over!

IT'S COMING: HPI RS4 PRO 3!

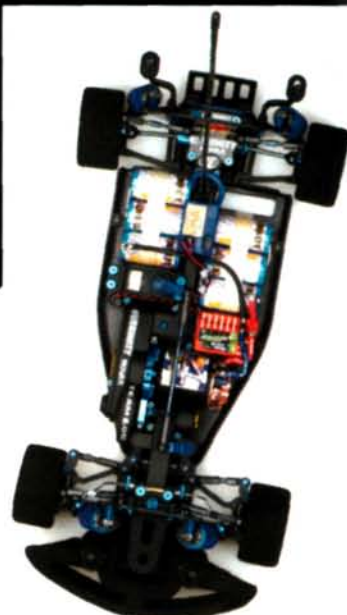
... and that's all I really have for you right now. While at the NIRA event, Shawn let it slip that HPI is already penciling in the details of the next RS4 electric sedan. Should you hold off on any new-sedan plans and wait for the Pro 3? I wouldn't; HPI has only just begun to think about the car. That means there's plenty of time, like a full year or more for unsubstantiated rumors and engineer-wannabe speculation!



PHOTO BY MIKE HENRY

BUILD YOUR OWN JOSH-MOBILE

If you'd like to transform your Team Losi Street Weapon into a slammed Cleveland carpet commando like Josh Cyrul's U.S. Indoor Champs-winning car, Trinity will soon be able to dial you in with a conversion kit. For about \$150 and an hour or so at the bench, your Street Weapon can be slammed with special front and rear bulkheads, front and rear graphite shock towers, shorter-than-stock Losi front shocks and a swaybar kit. Those are the major items; hardware and other widgets to complete the conversion will be in there, too.



Win a \$500 gift certificate from DuraTrax! Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids), and a brief description, to Readers' Rides, *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free *RC Car Action* decal sheet and will be eligible to win a \$500 gift certificate from DuraTrax in the "Readers' Rides of the Year Contest." Write your address and phone number on your letter and on the back of every photo you send. Good luck!

Readers' Rides

Luis Paz HPI RS4 Sport

This hot-looking HPI RS4 Sport features an HPI Mitsubishi Eclipse body, LRP V6 ESC, full ball bearings, Novak Mercury receiver, Steamline stock motor, Airtronics standard servo, Traxxas 2.0 wheels, HPI tires and a Trinity 3000 stick pack. An Airtronics M8 radio keeps it moving in San Diego.



Steve Allison Associated RC10GT and RC10T3, Team Losi Double-XT

Steve hails from Arizona and his collection includes an RC10GT with a New Era chassis, gold competition shocks and RPM rod ends. The T3 has a Streak ESC, Speed Gems 12T double motor and all Blue Team parts. The two Losi XXT graphite-plus trucks feature RPM rod ends and shock parts and 12-double and 12-triple motors. All the vehicles have Futaba 2PKA radios and Pro-Line Gladiator tires with RPM rims.

Herb Fishman Tamiya King BlackFoot

This Tamiya King BlackFoot was Herb's first truck. It's equipped with a Futaba 3003 servo, a stock motor, full ball bearings, Slim Twinz tailpipes, oil shocks and a custom wheelie bar. The BlackFoot is covered by a Parma Bigfoot body. The other truck is an Associated RC10T3 and has a Xipp Speed 27-turn motor, Novak reactor reversible ESC, HS-6058B servo, front and rear roll bars and Pro-Line foam tires. Both trucks call Cherry Hill, NJ, home, and each has a Novak reactor reversible speed control and runs on 2000 cells.



John Boyer Kyosho USA-1

A frame scratch-built by Homer City, PA resident John Boyer and hop-ups such as custom axle trusses make this Kyosho USA-1 unique. Other parts include two Trinity 17-turn Sapphire motors, Thorp axles and diffs, DuraTrax shocks and bearings, a Tekin Titan speed control and a custom-painted Parma Dodge Dakota body.



Readers' Rides

Alan Frigillana Tiu Jr. Tamiya TG 10

This slick-looking speedster out of Rockville, MD, features a Tamiya 2-speed transmission, full ball bearings, an MIP Boost Bottle, a Megatech push-starter, O.S. 15 CV engine, and Tamiya low-friction shocks. Alan added a Tamiya foam front bumper, along with original body and wheels to complete the look.



Scott Bennett HPI Nitro RS4

This stylish Bug is an HPI Nitro RS4 with custom modifications. Scott, who is from Southaven, MS, cut out the chassis around the lower control arms to allow for more suspension travel and removed the front dogbones and center belt—thus creating a two-wheel-drive vehicle. He also modified Kawada wheels to fit the DuraTrax tires. The stock engine has been equipped with a larger air filter, an MIP clutch and a Boost Bottle. The "stinger

pipe" is made of chrome automotive fuel tubing, and Scott filed the sunroof off of the Monster Beetle body for a smooth look.



Stuart Snyder Associated RC10GT

A Futaba Magnum Sport radio with S3003 servos controls this Associated RC10GT—the first RC car Stuart, of Galveston, TX, ever built. It has an OS .12 CVX, Dynamite bearings and Lunsford titanium turnbuckles. Parts by MIP include stinger pipe, shiny CVDs and clutch. HG provided the rear bulkhead, tranny brace, rear axle carriers, rear A-arm mounts, shock clamps and spring retainers. The GT is also equipped with RPM chrome rims, Pro-Line tires, GPM front shock tower and GPM A-arms.



Ron Bilgera Tamiya TL01

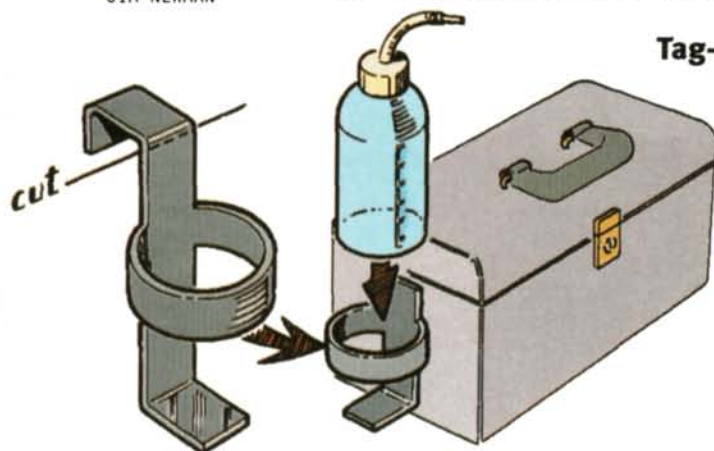
Ron's Tamiya TL01 has a Team Orion Pilot 13-turn motor, carbon gear and propeller shafts, front/rear swaybars, Dynamite ball bearings, a Trinity RC 1700 battery pack, Dean's battery plugs and a Tekin G-13 ESC. A Futaba Magnum Junior radio controls the TL01's moves on the tracks of Fremont, CA.

Pit Tips

ILLUSTRATIONS BY
JIM NEWMAN

WIN A FREE 1-YEAR SUBSCRIPTION!

Radio Control Car Action will give a one-year subscription (or an extension of your existing subscription) for each of your ideas used in "Pit Tips." Send a sketch and description of your idea to "Pit Tips," c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.



Tag-Along Fuel Bottle

Most new cars have built-in cup holders, but auto-parts stores still sell cheesy clip-on jobs so you can enjoy a Tab while you cruise around in your Gremlin. Pick up one of these cup holders for your pit box; just trim off the mounting hook and screw it to the side of the box to make a drop-proof fuel-bottle holder.

FORBES HUSTED

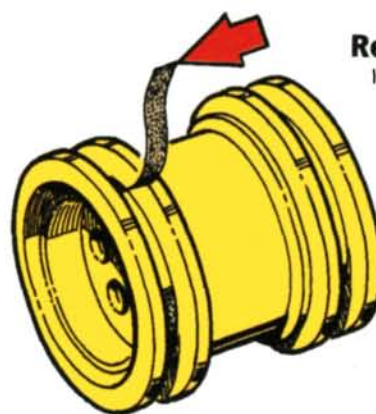
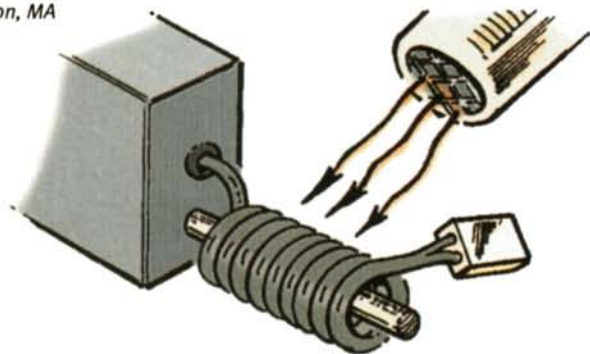
Mahwah, NJ

Neater Servo Leads

You've probably seen the old "coiled servo lead" trick before, but here's an addition: once you have the leads wrapped around a screwdriver for the coil effect, you can "set the curl" with a hair dryer so the leads don't come uncoiled after they're unplugged.

DAVID SANTOS

Boston, MA



Reusable Rims

If you aren't a racer and can't stand tossing out perfectly good rims just because the tires are worn, try this: instead of using CA to bond the tires permanently, mount them with narrow strips of double-sided carpet tape.

CHRIS TOLEDO

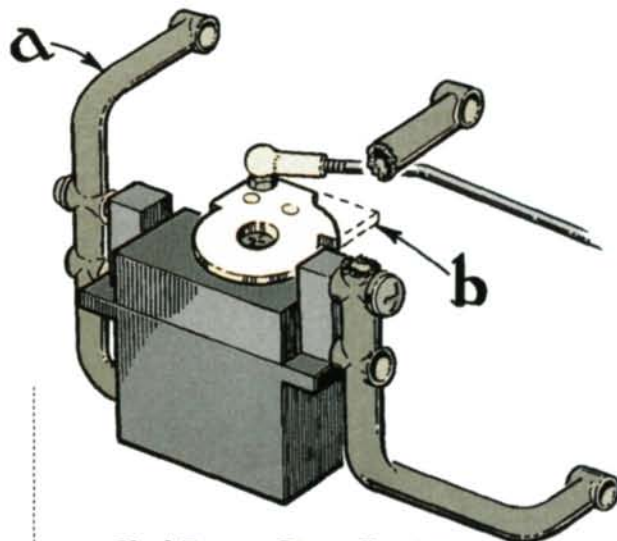
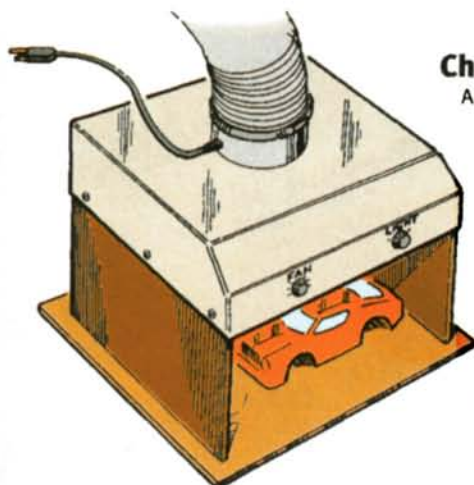
Pismo Beach, CA

Cheap Paint Booth

A discarded stove hood can make an effective spray booth; just extend the sides with masonite or lauan plywood, then route flexible ducting out a convenient window. The hood's variable speed fan and light make painting a pleasure and almost fume-free.

F.J. NIMPHIUS

Delevan, WI



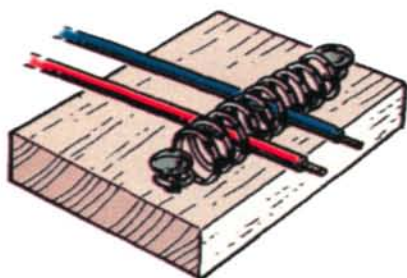
Clod Bump-Steer Buster

To minimize bump-steer in a long-travel Clod suspension setup, mount the steering servo between the twin-tube bumper (a). File a corner of the servo-saver (b) and bend the steering linkage to allow clearance.

EDWARD GARD

Mesquite, TX

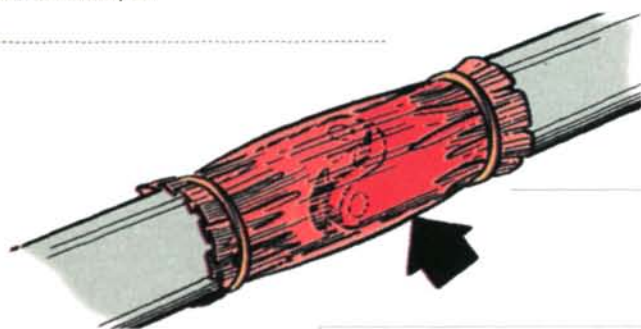
Pit Tips



Simple Soldering Jig

It's just a spring screwed to a piece of 2x4, but it sure comes in handy for tinning and joining wires. Make two jigs for splicing wire.

DEREK LOE
Corona del Mar, CA



Traxxas U-Joint Boots

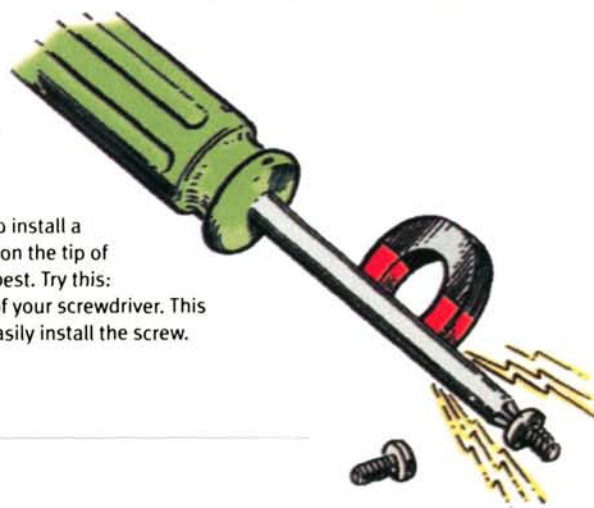
Seal out dirt, and extend the life of your U-joints by cutting the neck off a balloon and securing it with very small rubber bands.

STEPHEN MALFATTI
San Ramon, CA

Stay-Put Screws

Sometimes, it seems the only way to install a screw in a tight spot is to balance it on the tip of the screwdriver; that's awkward at best. Try this: attach a small magnet to the shaft of your screwdriver. This will magnetize it and allow you to easily install the screw.

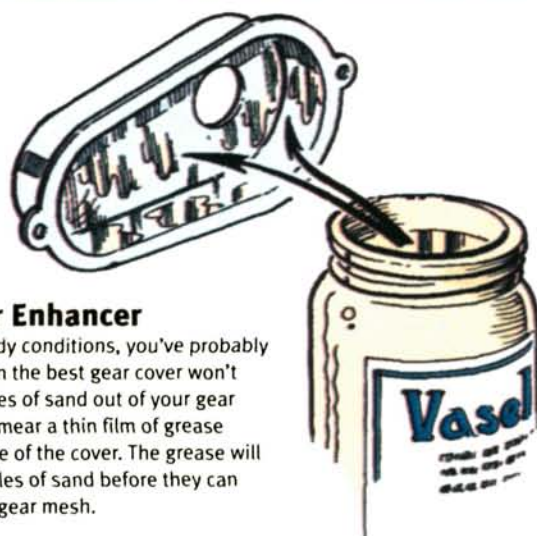
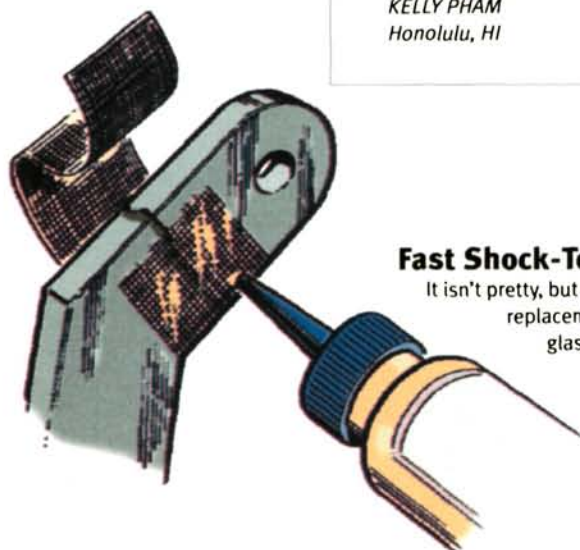
KELLY PHAM
Honolulu, HI



Fast Shock-Tower Fix

It isn't pretty, but this fix can get you through a weekend until you're able to get a replacement shock tower. Use CA to glue the parts together, then wrap fiber-glass strapping tape around the joint as you saturate it with CA.

TYSON THOMPSON
Los Altos Hills, CA



Gear Cover Enhancer

If you run in sandy conditions, you've probably noticed that even the best gear cover won't keep fine particles of sand out of your gear mesh. Try this: smear a thin film of grease around the inside of the cover. The grease will trap small particles of sand before they can bounce into the gear mesh.

MIKE ROMMEL
Prince George, BC, Canada



ROBINSON RACING PRODUCTS

Troubleshooting

BY DOUG MERTES • ILLUSTRATIONS BY JIM NEWMAN

Understeering Baja Champ

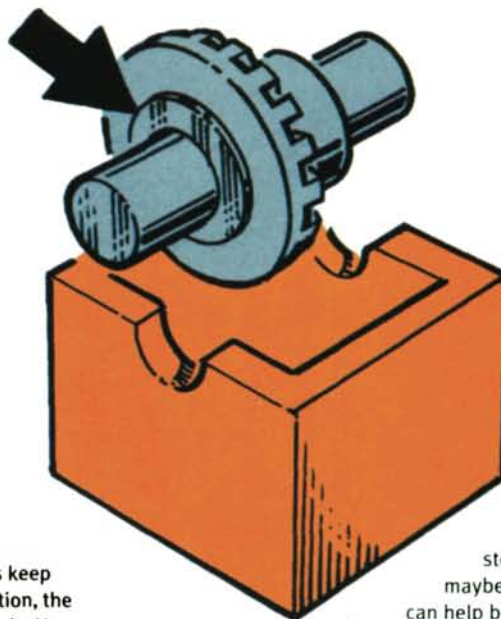
I recently bought a Tamiya 4WD Baja Champ Buggy. I installed oil shocks, full bearings and ball differentials. I have two problems that may be related. First, my car is turning really, really wide. Is this normal? If it is, can I buy something to make it turn more sharply? I am using the standard System 3000 servo from Tower Hobbies. My other problem is that, during acceleration, both front wheels wobble violently until the car gets going. I have no idea what's going on, and I hope I didn't waste my \$80.

STEVE GENSHEIMER
Wharton, NJ

When you get your Champ dialed in, you'll be saying that your \$80 was the best investment you ever made! The Tower Hobbies servos are perfectly fine "standard" units; they're good for about 40 oz.-in. of torque. That's plenty for the Baja Champ, and it should steer well with the kit motor. However, you will find that the kit "pushes" (understeers) at speed. Here's what I mean: if you wind the Champ up to full speed, then turn the transmitter's wheel to its stop, the wheels will be angled for a very sharp turn; although the car will turn, what it really "wants" to do is keep going straight. If you were on ice and the front wheels had zero traction, the car would keep going straight. That's a worst-case understeer scenario. Your car has enough traction to steer, but not enough to turn sharply at speed. To tighten up your car's steering response, adjust your driving style. Just before you initiate a high-speed turn, let off on the throttle, or even tap the brake. This will transfer weight to the front tires and help them to dig in.

As for your wheel-wobble problem (which also contributes to your understeer problem by preventing the tires from getting maximum traction), I suspect your car has worn front-axle bushings. Assuming you've assembled everything properly, that must be your problem. Replace them, preferably with metal bushings (better) or bearings (best).

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at *Radio Control Car Action*, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.



Nitro USA-1 Diff-struction

I have a Kyosho Nitro USA-1 with an O.S. RGB engine and an AL-650 tuned pipe. My problem is that the gear in the front gearbox (the large bevel gear beneath the clear plastic cover) keeps stripping. I have replaced it three times. Are there

steel gears I could try, or maybe some shims? I hope you can help because replacing this gear is getting expensive. Pretty soon, I'll just have a big nitro static model.

STEPHEN
Plant City, FL

Kyosho's hardened gear set for the Inferno DX will solve your problem. For you readers with 1/8-scale machines that do not have hardened gears, the best way to prevent stripping is to avoid aggressive driving on high-traction sur-

faces, such as pavement. Keep the diff gear well lubricated, and watch for play between gears. If necessary, place shims between the outdrive and gearbox to press the ring gear against the pinion. If you do strip out a ring gear, replace it with a hardened unit. If you strip one, you'll strip two!



JIM NEWMAN
1-005



ROBINSON RACING PRODUCTS

Troubleshooting

Unmotivated Motor

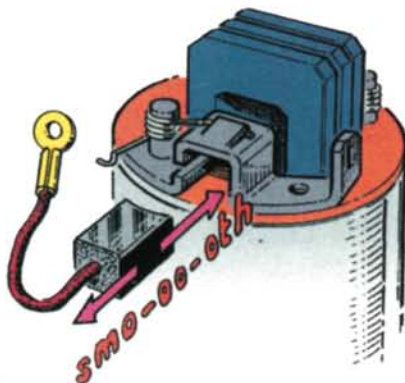
I have an HPI RS4 MT with a Trinity GT-2 17-turn triple motor, Hitec AM 2-channel radio and servo, a Novak Explorer Sport ESC and a Sanyo 1700 stick pack. My problem is that my car won't run at all. The LED lights up red when I turn it on and green when I put on the brakes; it goes blank when I push the throttle.

ZACH LONG

Lakewood, CA

From your description of the Explorer's LED lighting sequence when you activate the throttle, it's functioning properly, which means it's definitely sending juice to the motor. So why isn't the motor turning? Here are the likely causes and their remedies:

- The motor is disconnected. Are you using the bullet connectors that came with the Explorer and spade-type terminals to attach the male leads to the motor? Check each connection to be sure it is secure, and clean any contacts that appear to be at all dirty.
- One of the motor brushes is stuck in its hood, and it isn't contacting the commutator. Pull each brush back into the hood, then let the spring snap it back against the comm, and try the throttle again.



- The motor is jammed. This prevents the car from rolling at all, which you surely would have noticed, so I doubt that this is your problem. If it is jammed, it's probably due to a piece of stone between the armature and one of the internal magnets. If a sharp turn of the wheels doesn't free the motor, you'll have to disassemble it.



Unequaled Precision

Absolute Series Spurs



Available in 48P in 80T thru 91T, this is the quietest spur you can buy! RRP 1790 - RRP 1791

B3 / T3 Lite Aluminum Outdrives



Blue anodized and 40% lighter than stock ball diff outdrives. RRP 1502

Absolute Series Pinons



Available in 48P in 16T thru 28T sizes. Super hard, lightened and cut unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! RRP 1416 - RRP 1428

Unsurpassed Reliability

Outstanding Performance

Associated Blue Lightened Slipper Kit



The rear plate is hard anodized to reduce wear and the front plate is color treated. The front plate is designed to hold the slipper pad forcing the pad to slip on the rear plate. When pad shows sign of wear just flip it over for a new surface. Metal parts are CNC machined for a flawless fit. RRP 1515

RC10-GT Gas Spurs



Super tough and precision machined from heat-resistant plastic, these spurs mesh flawlessly with our Clutch Bells. 32P spurs in 54T thru 67T, RRP 2261 - RRP 2267, and 32P bells in 14T (New) thru 24T, RRP 2214 - RRP 2224

Slow-Steering 'CR'

I own an XXT-CR, which I've had for about two years; there is excessive play in the steering. The front tires can be moved slightly in opposite directions, and the wheels can be turned right or left a little without turning the servo. Also, when I turn right or left while driving, the servo re-centers itself, but it's a little offset in the direction I turned. I have stock bushings in the steering bellcranks, and I use an Airtronics 94102 servo. Is there an inexpensive way to fix all of these problems? After all, I'm on a budget. [email]

ADAM MORGAN

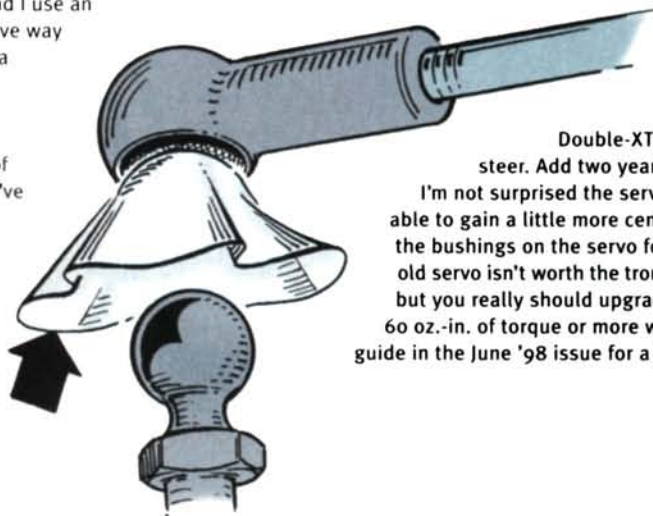
Adam, two years is a long time to run a set of plastic ball cups; I'm not surprised that they've gotten "sloppy." You can temporarily fix the problem by shimming the ball cups with pieces of plastic bag, but that won't last long. Retire your old ball cups, and replace them with fresh pieces from Losi, Robinson Racing Products, or RPM. Robinson's "Sure Fit" design allows you to dial out slop; RPM's ball

ends are super heavy-duty and are available in neon blue and yellow as well as classic black. New ball ends will improve steering precision substantially, but if you want the most precise action possible, upgrade those bellcrank bushings to ball bearings.

Now that the steering is dialed in, we can address the servo. The Airtronics 94102 is a reliable "standard" design, but the

Double-XT is a lot of truck for the servo to steer. Add two years of use to the equation, and

I'm not surprised the servo is getting tired. You might be able to gain a little more centering precision by swapping the bushings on the servo for bearings, but an inexpensive, old servo isn't worth the trouble. I realize you're on a budget, but you really should upgrade to a stronger servo; one with 60 oz.-in. of torque or more would be best. See the servo guide in the June '98 issue for a full listing. ■



Superb Quality

RC10-GT Steel Combo



Precision machined one-at-a-time from a single piece of steel and then hardened this 65T spur and 15T bell combo will last and last. The extra-hardened clutch bell fits ALL Associated and MIP shoes. RRP 2365

Associated Titanium Stealth Top Shaft



CNC Machined from a single piece of titanium, this super hard, super light top shaft will fit any Stealth transmission. No serious racer should do without this part. RRP 1512

Intelligent Innovation

RC10-GT Hardened Steel Idler Gear



Cut from solid steel stock, this gear is lightened and then hardened for super quiet precision and extra long life. Jamin' tranny grease is included. RRP 2213

Thoughtful Design

RC10-GT Hardened Diff Gear



Hard anodized, precision machined aluminum diff gear. RRP 1513



1999 World Cup and National Champion

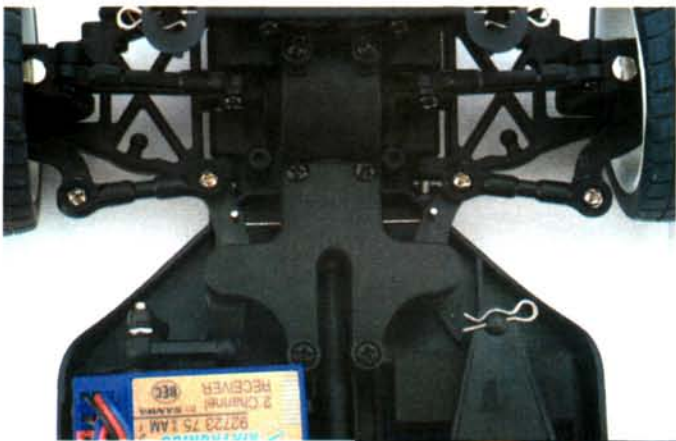
"I only care about performance, and that's why I run Robinson Racing gears and slipper clutches exclusively."

— Richard Saxton



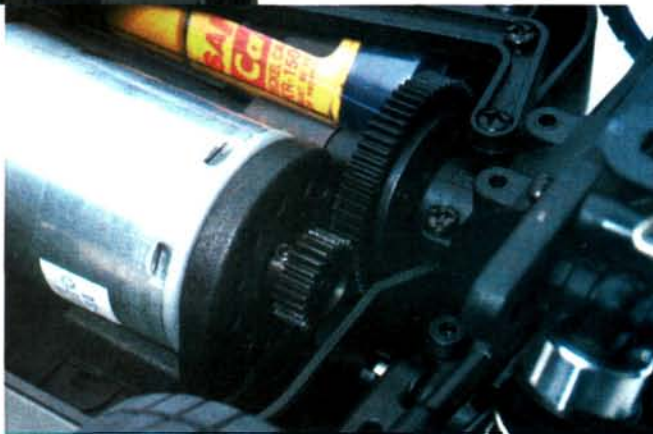
ROBINSON RACING PRODUCTS

4968 Meadow View Drive · Mariposa, CA 95338 · Voice 209.966.2465 · Fax 209.966.5937



Unlike the Associated TC3, which the STR-4 emulates, conventional steering bell-cranks handle the steering chores. Like the camber rods, the tie rods are fixed links.

To set gear mesh, the motor mount can be moved across the chassis via slotted mounting holes in the chassis.



adjustable to alter the wheel-base. Most STR-4 buyers will be beginners and probably won't exploit the car's tunability, but as their skills improve, the STR-4 has the tuning capability to grow with them.

- **SPEED CONTROL.** A wiper-arm, mechanical speed control is included with the kit. The wiper-arm design is incredibly smoother than the three-step components included in other kits. And, yes; most drivers will ditch the MSC and replace it with an electronic speed control. Remember that the STR-4 is priced and equipped for entry-level racers. Just add a transmitter and battery pack, and you are all set.

When using the MSC, the on/off switch from the radio system needs to be soldered to the unit. In my opinion, this is a downside to the kit, since its intended buyer is most likely a beginner. Anyone who buys a 90-percent-built chassis should not be expected to have to solder.

- **BODY, TIRES AND WHEELS.** If you have been in this hobby for even a short while, the name Protoform* should sound familiar. Protoform produces high-quality bodies that not only look great but also improve handling. Academy hooked up with Protoform and offers the STR-4 with either a Honda Accord (STR-4 Beta) or an Alfa Romeo 156 (STR-4 Alpha) body. I received the Honda version of the STR-4 (a 2-door body is included, but mine had been scuffed in shipping. Peter Vieira painted up a 4-door Accord for the test; thanks, Pete.)

Protoform's Accord shell comes with all the necessary accessories to create an authentic-looking touring car: a rear wing with mounting hardware along with window masks and decal sheet. The folks at Academy went one step further with the Protoform body and marked the wheel wells and body postholes for you. Just cut along the marked lines, and the body will fit perfectly onto the chassis. This is a definite time-saving step, especially if you are a beginner. Achieving the nice round shape of a wheel well and finding the correct location for the body post holes is not easy, so thank you, Academy.

Although it is more a part of the chassis than the body package, this is a good time to mention the kit's swivel body supports. Some other kits use only a body clip for the body to rest on, which works OK until you have a few hard crashes and the pins end up ripping through the body. The swivel mounts' larger surface area and ability to rest at the same angle as the body reduce the chance of damage.

The wheels and tires are pretty standard for the entry-level touring car class: one-piece molded-white-plastic wheels with 6-spoke street tread tires and foam inserts. The tires look a little thin and prone to wear, but once again, the tame kit motor shouldn't be too hard on the tires. The STR-4 uses standard 12mm wheel-hex adapters that open the door to a ton of wheel options.

PERFORMANCE

The maiden run of the STR-4 took place on my long, flat driveway. I chose to leave the kit stock and observe its capabilities before I made any changes. This did not last long. The STR-4 was pitifully slow with the stock 540-type motor and was not fast enough to reveal any good or bad handling traits. I needed more punch to bring out the car's handling characteristics. I replaced the stock motor with a Trinity* Speed Gem Sapphire. Be careful if you follow in my footsteps: my motor choice proved to be the undoing of the mechanical speed control. The MSC could not handle the

increased amp draw and revealed this with a puff of smoke when I gave it reverse. Oops! I lost reverse, but still had forward.

Now, with the new powerplant, I was able to see what the STR-4 could do. After I checked the trim settings on the steering servo, it was time to drop the hammer. All four wheels hooked up, and the STR-4 was gone. Putting it through the motions, the increased speed made a noticeable difference. Suspension and drive train were fully coming into play. The drive train provided a smooth transition from stop to topped out. At full speed, the STR-4 stayed straight and true. Coming to the end of the asphalt, I powered through the turn and detected a slight push (a common trait of 4WD vehicles). Maintaining control of a car with a slight push is much easier than dealing with oversteer. I decided to put the STR-4 into some S-turns and found the stock suspension setup not stiff enough for all the added power. Body roll was excessive, but with a heavier-weight shock oil and the optional swaybars, the problem was resolved. Remember, if you keep the kit in its stock form, the aforementioned handling characteristics will not be as noticeable.

THE VERDICT

My only real gripe with the STR-4 is the modification needed for the radio system installation. None should be required, especially since the car is intended for entry-level racers. A kit that comes 90 percent built is a huge plus for someone who is unsure of his building skill, or for a beginner to the hobby; but to be so close to running, only to be confounded by the relatively simple task of installing the radio, would be disappointing to anyone. That said, you have to give credit to MRC/Academy for finding a formula that allows them to produce a high-quality, entry-level touring car with a price tag for those on a limited budget. When you consider all the hop-ups offered by Academy that improve this kit to competitive levels, you cannot help but be impressed with the package.

*Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■

Mugen MTX-2

**Taking sedan racing to
a higher level** by Greg Vogel



PHOTOS BY WALTER SIDAS



At the last Chicago Model and Hobby show, Mugen* unveiled high-resolution CAD drawings of its new, $\frac{1}{10}$ touring car. Although still in development stages, the car was the talk of the show among nitro touring-car fans.

Available at last, the MTX-2 is a dramatic departure from Mugen's previous sedan offering, the Prime 12; all they share is the Mugen name. The MTX-2's features, however, are very similar to another Mugen racer—the world-champion MRX-2 $\frac{1}{8}$ on-road car. Did the MRX pass on its winning ways to the MTX? To find out, I dissected the car on the bench and tested it at the track.



Left: Recesses in the 3mm-thick chassis allow the engine-mounting screws to sit flush, and all holes are countersunk. **Below:** Sealed differentials take care of regulating power to the wheels through cornering. Mugen supplies 5,000WT oil to fill the diffs.



Right: here's a look at the 2-speed before it was installed. The pinion gears are threaded onto the clutchbell, and second gear is actuated by a cam system.



DATA CENTER

Vehicle type: 1/10-scale 4WD competition nitro touring

Best Buyer: experienced nitro racers

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions: satisfactory

Parts fit: very good

Durability: very good

Overall performance: excellent

LIKES

- Packed with tuning features; great for racers.
- Outstanding performance.
- 2-speed included.
- Rear exhaust engine.

DISLIKES

- Center belt is a bit sloppy.
- No tuned pipe.
- Instructions are somewhat vague.

SPECIFICATIONS

SCALE 1/10

LIST PRICE \$699.99

STREET PRICE \$449

TOP SPEED 55.6mph*

DIMENSIONS

Wheelbase 10.2 in.

(260mm)

Width 7.835 in. (199mm)

WEIGHT

Gross, RTR 62 oz./

1,755g

CHASSIS

Type Double deck

Material Molded plastic/
3mm 7075 aluminum

DRIVE TRAIN

Type 3-belt

Primary Clutchbell/spur
2-speed

Drive shafts Steel dog-
bones

Differential(s) Bevel gear

Final drive ratio First

gear=7.42:1; second

gear=5.71:1

Clutch Three-shoe

Bearings/bushings

Bearings

SUSPENSION

Type (F/R) Double

A-arm/upper camber link,
lower A-arm

Damping Adjustable
oil-filled coil-over

WHEELS

Type One-piece plastic

Width 26mm

TIRES

Type Tread with foam
insert

POWERPLANT

Engine MT12

rear-exhaust

Carb Three-needle slide

Pipe (not included) RB
Concept

Fuel used O'Donnell 20%

RADIO GEAR (not included)

Transmitter Futaba 3PJ

SERVOs (not included)

Steering Futaba 9402

Throttle Futaba 9101

* Top speed valid for test sample only; speed of other MTX-2 kits may be set higher or lower depending on equipment, engine setup and test conditions.

KIT FEATURES

• **CHASSIS.** A plate of 3mm-thick 7075 aluminum is the backbone of the MTX-2; few other kits include such a sturdy platform as stock equipment. Most cars spec 2.5mm-thick plate and increase the plate's width or add radiused edges to increase strength, but these chassis still feel somewhat flimsy. The MTX-2's chassis is much stronger, as measured by the racer's "hand-flex test."

All of the screw holes in the chassis underside have been countersunk to accept flat-head screws. On the downside, the chassis edges are extremely sharp. Be careful when you handle the car; you could cut yourself. Even the flywheel opening is sharp and could harm your starting wheels. I took some extra time to prep the chassis with a metal file and suggest you do the same.

Large openings below each diff not only reduce the overall weight of the car but also allow harmful debris to eject rather than turn the belts and diffs into road chum. A large hole in the center also helps lighten things; four recesses below the engine allow the engine-mounting screws to sit level with the bottom of the chassis. To allow for minimal engine adjustment, these holes

are only slightly elongated.

An easily removable, molded upper deck bolts to the front bulkheads and extends to just in front of the suspension. For easy maintenance, after you remove nine screws, the upper deck can be removed with all the electronics. The openings for the servos are nonadjustable but will fit any standard-size, high-torque, high-speed servo. A raised area is provided for the receiver to sit slightly above the aluminum chassis. A battery cup is molded in the upper deck to house a side-by-side, 5-cell receiver pack that is held in place with strapping tape. To eliminate flex in the engine area, a single plastic brace reaches from the back of the upper plate to the rear bulkhead. The brace is very effective, as it doesn't allow a gap change in the gear mesh. A small, composite-plastic plate stretches across the rear bulkheads for strength and to support the brake shaft.

The front urethane bumper is captured between an upper and lower plastic sub-bumper. Urethane bumpers as stock equipment on any car are a welcome sight, as they not only protect the suspension components on impact, but they also support the front of the body and reduce body chatter.

building & setup tips

The MTX-2 was built with the racer in mind, and racers should have little difficulty building the car. Let me give you a big tip up front, however; find the set-up sheet in the center of the parts-list pamphlet. It will save you time and answer some of the questions you may have during the building and tuning process. Here are a few more tips that will save you some time and make the build a whole lot easier. Each tip corresponds with the step in the manual.

■ **Step 2.** Most of the parts are bagged according to the steps; however, there are a few stragglers. The bearings and gasket for this step are located in another bag with the belts, but you'll find them without any problem.

■ **Step 3.** Do not overtighten the retainers against the pivot balls. Tighten them just enough to allow the balls to pivot freely.

■ **Step 4.** The manual does not specify how far to screw the pivot balls into the arm. Measure the distance between the arm and steering knuckle from the top. I set mine to 5mm. Do the same for the lower pivot,

except measure from the bottom; the parts should be 3.25mm apart. This gave me a width of 199.20mm.

■ **Step 6.** Don't forget to cut the extra swaybar mount off the bottom of the arm.

■ **Step 7.** Similar to Step 4, but this time, measure 3.5mm between the arm and hub in the front and 4.5mm in the rear. The rear width with these settings is 199.85mm.

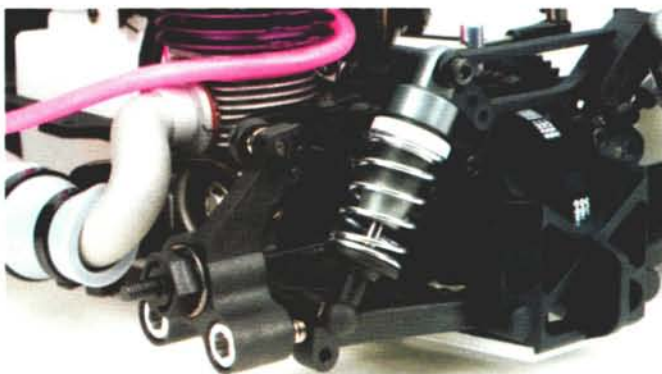
■ **Step 11.** With the front ball pivot set to the specs listed above, my steering tie rods were set to 74mm from end to end.

■ **Steps 14 and 18.** To determine which pulleys go where, use the picture and part number in the parts listing in the back of the manual.

SETUP

Mugen has really done its homework. Built according to the included setup sheet, the car works well and should be an excellent starting point for further tuning on your home track. A set-up board, setting blocks, camber gauge and a set of calipers will help get your car dialed in.

• **SUSPENSION AND STEERING.** If you're looking for the most adjustable suspension system available on a touring car, the MTX-2 has it. First, you'll notice up front that the suspension consists of double A-arms, much like a scaled-down version of Mugen's new MRX-2 1/8 on-road racecar.



The rear of the car is very adjustable. Toe and camber adjustments as well as slight track adjustments can be made. Fine ride-height adjustments can also be made with the threaded shock bodies. Note the little tab behind the outdrive; up and down travel can be limited by adjusting a screw in the tab.

The lower arms have wide bases and are hinged to the bulkhead with long pins retained by setscrews. A suspension setting block slides over the fronts of the hinge pins and bolts to the arms. This critical component allows you to set the up- and down-stops of the suspension arms.

The upper arms are flat and swept forward, and like the lower arms, they are universal and will fit on either side of the car. Small

YOU'LL NEED

- 2 channel radio and receiver.
- Steering and throttle servos.
- Receiver battery.
- Fuel.
- Body.

test gear

• **Futaba* 3PJ transmitter and receiver.** The 3PJ remains a favorite for gas racing, thanks to its handy idle-up function and class-leading receiver. After you've mastered its functions, it will never

leave you wishing for more radio tunability.

• **Futaba S9101 throttle servo, S9402 steering servo.** These are solid performers for a nitro sedan and offer all the speed and torque to bring out the MTX-2's best.

• **Mugen Seiki 900mAh NiMH receiver pack.** I don't take chances with receiver packs—the more milliamps, the better. Mugen's house brand NiMH pack is perfect for the MTX-2.

• **RB* tuned pipe.** The kit doesn't include a pipe, so I took the

opportunity to bolt on a high-performance model. The RB is ROAR- and EFRA-legal, and it allows the kit engine to breathe its best.

• **O'Donnell* 20-percent nitro racing fuel.** I've always had good luck with this stuff, and my engines last; that's all I need to know.

TRACKTEST Mugen MTX-2

To adjust caster, the upper arm can shift forward and backward. Threaded shocks are also used up front. Notice the small hole in the shock cap that is used to release air trapped in the shock.



The steering knuckles are set up on a pivot-ball system which reduces the number of moving suspension components. The stub axle is almost completely supported by the ball bearings, as on larger, 1/8 on-road cars.



clips are provided to change the position of the upper arms, thereby increasing or decreasing caster. A pivot ball connects the arms to the knuckle. By adjusting the upper pivot ball, you can alter the camber angle. By adjusting both the upper and lower pivot balls equally, you can make minor changes to the front track of the car.

The steering knuckles each capture two large-diameter, metal-shielded bearings to support the axle shaft. The knuckle is attached to the arm by the pivot balls that go through it and thread into the arm.

A highly adjustable, rear-suspension system is fitted to the MTX-2. Like the front arms, the lower arms are hinged to the bulkhead with captured pins. Unlike the front arms, two pivot balls are threaded into the end of the lower arm, while a single tie rod is used on top to secure the top of the carrier. This system allows minute track and toe adjustments via the pivot balls, and the usual camber changes via the upper camber link. The MTX-2 offers four outboard camber-link-mounting positions on the hub carrier and two inboard positions on the shock tower.

Smooth aluminum dampers bolt on to all four corners of the car. Their gray-anodized bodies are threaded for fine ride height adjustments with aluminum collars that have rubber O-ring inserts to retain adjustments. Inside, a locking nut holds Teflon pistons on the shock shaft. One-hole pistons

are provided for the front; two-hole for the rear. A rubber bladder in the shock cap compensates for oil displacement when the shock is compressed. Silicone oil and hard springs wrap up the dampers' features.

The MTX-2 relies on a simple servo-saver and tie-rod steering system. The large servo-saver comes with several inserts to fit most of today's popular servos, and adjustable steel tie rods connect the saver to the steering knuckles.

• **DRIVE TRAIN.** The front and rear diffs look different on the outside but are mechanically identical and feature cast-metal bevel gears. I doubted the durability of the cast gears, but since learning the same material is used for the diff gears of Mugen's MBX-4 1/8-scale buggy, I'm confident they'll be good for the life of the car. Steel outdrives are inserted into the diff case and are sealed with rubber O-rings. The two diff halves are sealed with a fiber gasket. Mugen even supplies 5,000WT silicone oil to fill the diffs. Finally, someone has answered my prayers and included real silicone diff lube in a kit! Mugen gets two thumbs up here. The heavy fluid helps limit the diff action in cornering and allows you to apply the throttle much harder through the turn.

A three-belt drive system couples the diffs to the engine. My only gripe with the system was the slop in the center belt that passes behind the engine. There's too much deflection for my taste, but it can easily be cured with an optional belt tensioner.

Power is transferred from the diffs to the wheels by some stout hardened steel axles with beefy crosspins. They seem pretty large when compared with other cars'; that's a good thing. Standard 12mm hex adapters are supported by steel pins through the axle and accept a wide variety of wheels.

• **ENGINE.** Some high-end kits leave the choice of engine to the builder, which is fine, but Mugen has a special engine deal going with NovaRossi that will save you some bucks and guarantee you horsepower that's more than competitive. Nova is producing a .12-size rear exhaust engine that can be included with the car depending on which kit you buy. Besides a rear-exhaust port, the engine also features a three-needle slide carb, purple-anodized heat-sink head and special spring-held manifold.

A three-shoe race clutch with a lightweight purple fly-wheel bolts to the engine. A ball-bearing-supported clutchbell features a threaded tube to accept interchangeable pinion gears. The MTX-2 comes stock with a 2-speed clutch—a real benefit, since you must usually purchase the 2-speed and clutch setup separately from Serpent.

First gear consists of a 16-tooth pinion and a 47-tooth spur gear (7.42:1 ratio); second gear is a 19/43 (5.717:1).

The Mugen NovaRossi .12 rear-exhaust engine is a powerful little mill. Check out the three-shoe clutch and spring-mounted exhaust header; they are stock equipment.



THE COMPETITION	MUGEN NITRO MTX-2	SERPENT IMPACT	HPI NITRO RS4 2	KYOSHO WORLD CUP
	Wheelbase	10.2 in.	10.2 in.	10.2 in.
	Width (F/R)	7.835 in.	7.64 in./7.5 in.	7.795 in.
	Weight	62 oz./1755g	62.6 oz.	54.5 oz.
	Diff type	Bevel gear	Planetary gear	Bevel gear
	Chassis (lower/upper)	Aluminum/plastic	Aluminum/plastic	Aluminum/plastic
	Engine	Mugen .12 rear exhaust	Serpent Mega .12	Kyosho GSX-11
	Header/pipe	Round port header	Header/tuned pipe	Header/tuned pipe
	2-speed	Yes	No	Yes
	List price	\$699.99	\$650	\$469.99
	Street price	\$449	\$389	\$349.99
	Reviewed in	4/00	1/00	11/99
	†Competition chart does not reflect all cars available in this class.			

• **BODY, TIRES AND WHEELS.** The MTX-2 comes stock with white, 6-spoke rims, sponge inserts and standard-size treaded tires. These tires get the car rolling, but for race conditions, they just aren't happenin'. I bolted on Gumby rims and new H-13 compound slicks from Pro-Line,* with Pro-Line inserts on the rear. I used the same tire/rim combo up front, with the exception of Yokomo* hard inserts inside the tires.

Instead of the overplayed Stratus body that most racers use, I selected a

Continued on page 201

DuraTrax Nitro Quake

**Ready-to-rumble
RTR**

by Kevin Hetmanski

Anyone who knows me knows that I am a huge fan of RC monster trucks. I love that they can go where other types of RC vehicles can't. The RC nitro monster truck scene has grown tremendously of late, and the newest monster in the lineup is DuraTrax's* Nitro Quake. It's big and beefy, and it comes out of the box ready to run! The truck impressed me at first glance, but there's far more to a "Track Test" than a simple visual inspection; keep reading!



PHOTOS BY WALTER SIDAS



TRACK TEST DuraTrax Nitro Quake



The supplied Torq 21 engine is a powerful mill that can get this massive monster up to speed in a hurry. For those of you who are unfamiliar with nitro, DuraTrax supplies a video to help you get up and running quickly.

DATA CENTER

Vehicle type: 1/8-scale, ready-to-run, nitro-powered, 4WD monster truck

Best buyer: newcomers to nitro; monster-truck lovers; anyone who wants to get up and running quickly

KIT RATINGS (poor, satisfactory, good, very good, excellent)

Instructions: good

Parts fit/finish: good

Durability: good

Overall performance: very good

LIKES

- Big, burly design.
- Ready to run, right out of the box.
- .21-powered with pull-starter!

DISLIKES

- Body mounts hit shocks (a minor problem, but it's still there).
- Tires aren't glued very well.
- Steering servo is a little on the weak side for this application.

SPECIFICATIONS

SCALE 1/8

PRICE \$499

DIMENSIONS

Wheelbase 12.75 in.

(323.9mm)

Width 16 in. (406mm)

WEIGHT

Total, as tested 166 oz. (4,704g)

CHASSIS

Type Double-deck
Material 3mm 6061-T6 aluminum

DRIVE TRAIN

Type Shaft
Primary Clutch bell/spur gear
Drive shafts (F/R) Universal/dogbone
Differentials Bevel gear
Bearings Shielded ball bearings throughout

SUSPENSION

Type (F/R) Lower A-arm with wishbone upper link/upper and lower wishbone
Damping Oil-filled aluminum shock

WHEELS

Type Chrome-ribbed molded plastic

TIRES

Type Chevron tread

ELECTRONICS (included)

Transmitter Hitec Lynx AM
Receiver Hitec
Steering servo Hitec 605BB
Throttle servo Hitec HS303

ENGINE AND

ACCESSORIES (included)

Engine DuraTrax Torq 21, rear exhaust, round port
Carburetor Slide valve
Manifold Aluminum, spring type
Pipe Tuned

The steering bellcranks are beefy. The pivot ball for the steering rod is at the end of the arm, rather than on top. Note the small arrow on top of the suspension arm; this is helpful when the suspension needs to be reassembled after maintenance.



KIT FEATURES

• **Chassis.** Remember the DuraTrax Axis that we tested last month? The Quake uses the same chassis, and with its sweet blue color, it really stands out. A long, upper aluminum plate reaches from gearbox to gearbox and makes it nearly impossible for the chassis to flex. Except for the engine-mounting screws, all of the screws on the chassis' bottom have been countersunk to keep them from hanging up on any obstacles (the motor mount is attached with button-head screws). A slot is cut out of the bottom plate so that a starter box can be used to start the engine if a non-pull-start powerplant is installed later. The chassis' layout is typical of most 1/8-scale buggies; the engine and fuel tank are mounted on the left, the electronics on the right. The radio box/servo plate is a one-piece unit that runs the length of (and lends additional stiffness to) the already overbuilt chassis.

• **Suspension.** Once again, the Quake shares its parts with the Axis buggy. The truck's front end consists of the typical lower A-arm

with upper-link suspension that's found on most cars. The upper and lower suspension pieces are marked with arrows pointing to the front of the truck. If you ever have to remove the suspension arms, the arrows will remind you how to install the arms. Hub carriers are attached to the end of the suspension links. Plastic hubs house the bearings for the front wheels. The truck's rear end is set up a little differently; upper and lower wishbones are used to support the rear hubs via pivot balls. Two adjustable rods attach the rear hubs to the gearbox and allow you to adjust rear toe. The rear suspension even has adjustable caster. The lower hinge pins have a button head at one end and are held in the arm with a C-clip at the other end. All upper links have various mounting positions to choose from. The upper links are attached with long shoulder bolts. Blue-anodized shocks are attached to all four corners of the truck and provide smooth damping. The rear shocks are mounted in such a way that they come into contact with the bottom of the body posts when the suspension is compressed, but this is easily fixed with a little trimming

building & setup tips

■ Before you run your new truck, check the tires to make sure that they have been securely glued to the rims. The preglued tires on my truck required some extra gluing, and this is easier to do when the truck is still new and clean. While you're at it, drill a small hole in the rim to allow air to flow in and out; this will help prevent the tires from getting flat spots in them.

■ When you pull the truck out of the box, you'll notice that the rear body mounts come into contact with the rear shocks when the suspension is compressed. There are two ways to fix this problem; you can simply cut off the bottom part of the body mounts, or you can raise the body. I chose to raise the body because I like the look of a higher riding body, and I was too lazy to cut the body mounts.

■ Our test kit had no fuel tubing on the brake linkage. For smoother braking, remove the collars from the brake rods and place a small piece of fuel tubing between the collar and brake lever.

■ This truck is assembled and ready to rock, but you might want to take the time to make certain that everything has been properly installed and that all the screws are tight; some of them loosened up on my truck while I was driving it. After you've run it for a few minutes, park the truck and give it a quick check to be sure everything is where it should be. Humans built the truck, and humans make mistakes. It's always good to double-check things.

■ A basket under the fuel-tank lid prevents large pieces of debris from falling in, but it's a good idea to install an in-line fuel filter to keep out finer dirt particles, too.

• **Steering.** Twin bellcrank steering is used to guide the truck. The bellcranks pivot on strong steel pins that are fixed at the top and bottom, while the rod ends pivot on a ball stud that has been threaded into the ends of the bellcranks. A built-in servo-saver is included. Adjustable turnbuckles are not, but who cares? It's a monster truck. If you really feel compelled to adjust front toe, the threaded tie rods will allow you to make the adjustment with only slight disassembly.

• **Drive train.** Power is transferred from the engine to the drive train through a 3-shoe clutch and 14-tooth clutch bell. The center differential consists of a 51T main gear with a planetary gear differential inside. The front and rear differentials mate with the center unit via dogbone drive shafts. These diffs also use a planetary gear setup inside. The rear wheels are driven by dogbones; the fronts use universals. Two composite disc brakes slow the truck and can be adjusted individually.

• **Engine and accessories.** The large, 125cc fuel tank has a huge opening for quick fueling; it also features an adjustable fuel nipple. A large basket under the lid prevents large debris

YOU'LL NEED

- Fuel.
- Fuel bottle.
- Glow igniter.

FACTORY OPTIONS

- Racing clutch springs (3)—part no. DTXC7170.
- Steel main gear (51T)—DTXC8302.
- Stabilizer bar set—DTXC9575.
- Titanium shock shafts (2)—DTXC9731.
- Torsion differential (F&R/center)—DTXC9734/DTXC9733.
- Turnbuckles, 5x35mm (2)—DTXC9748.

test gear

• **Hitec Lynx AM transmitter and receiver (included).** It's not a high-end radio, but it's good enough to guide this big truck around. This radio features throttle and steering trim, dual-rate steering and servo reversing. Unless you plan to race (which is doubtful, since the Quake is a monster truck, not a racer), this is all you'll need.

• **Hitec 605BB steering servo (included).** An 1/8-scale monster truck has a lot of weight to throw

around, so DuraTrax supplies a Hitec 605BB steering servo, which claims to deliver 91 oz.-in. of torque at 6 volts. This is much better than a standard servo; nevertheless, it still has a bit of trouble turning the huge monster tires on the truck.

• **Hitec HS303 throttle servo (included).** DuraTrax uses a standard Hitec servo for the throttle and brake chores. It doesn't take much torque to pull open the engine's throttle, so that's not a concern, but powerful braking requires more muscle than is provided by a standard servo. The

Quake has acceptable stopping power, but if you're looking for better braking, then switch to a servo with more torque.

• **"Heavy Duty" transmitter and receiver batteries (included).** DuraTrax includes 12 AA batteries to power the truck's transmitter and receiver. They're enough to get you up and running, but they don't last very long. When you replace these cells, it's a good idea to use high-quality, rechargeable cells. They cost more than standard dry cells, but they won't have to be replaced for a long time.



TRACKTEST DuraTrax Nitro Quake

from falling into the tank. A pull-start Torq 21 engine gets this monster rolling; the engine features a slide carburetor with high- and low-speed needles, ABC construction, heavy-duty air filter, heavy-duty connecting rod and rear exhaust. The crankshaft is supported by two, heavy-duty ball bearings. To help improve the truck engine's performance, DuraTrax has also included a header/tuned-pipe combo. Noticeably absent is the trick pipe mount found on the Axis; a functional music-wire support does the job for the Quake.

• Body, wheels and tires.

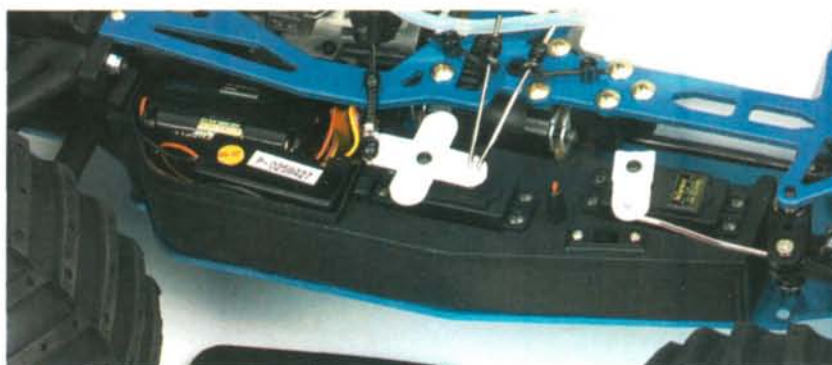
To help you along, DuraTrax includes a pre-painted body in the kit; just add stickers and the chrome detail pieces, and you'll be good to go. The tires have the familiar chevron tread design, but they are taller and narrower than most monster trucks'. Their large diameter will help the truck achieve a higher top speed, and the smaller contact patch created by the tires' narrow design should give the truck better steering. Ribs that stretch from the hub to the tire flanges reinforce the Quake's chromed plastic rims; they also give the rim a cool look and add strength. I did have to reglue the tires to the rims, however; DuraTrax did not strip the chrome from the bonding area of the rim, and this allowed the tires to pull loose. Huge, 19mm hex hubs mate the wheels to the drive axles.

• **Other stuff.** In the box is a video that explains how to break in your new engine and offers great tips on how to tune the engine, once it's up and running. This video is tremendously helpful for first-time nitro buyers. DuraTrax also gives you a great little molded socket tool to loosen and tighten the nuts that hold the wheels on. You'll no longer have to use six extensions attached to the socket to reach the nut.

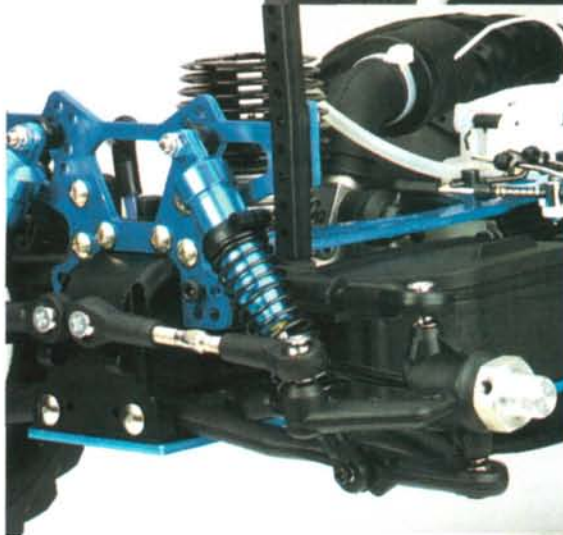
PERFORMANCE

After adjusting the brakes and giving the truck a quick look-see, I grabbed my gear and headed outside. I'll spare you the engine break-in details; suffice it to say that I followed the kit instructions and the included video to the letter.

Since I live in a wooded area, my yard was the perfect place to test



Above: this is the command center of the truck. The radio tray/receiver box spans the side of the chassis. In conjunction with the long upper plate, this gives the truck a strong backbone.



Left: large turnbuckles adjust the rear toe of the truck. Notice how close the body mounts are to the rear shocks. When the suspension is compressed, the body mount interferes with the shock. This can be fixed by raising the mount or by trimming the bottom of it.

the Quake. I was very pleased with the truck's acceleration. It isn't exactly light, but the Torq 21 must really have torque because before I knew it, I was hitting the brakes to prevent the truck from going into the woods. While blasting up and down the yard, I noticed that the front differential was unloading slightly. You can tone this down by disassembling the diff and applying thick grease to the gears.

Although it had plenty of speed and power, the truck was lacking in the steering department. When those big tires get moving, they act as huge gyroscopes, and the servo has to work even harder to move them. A servo with more torque would be a welcome fix to this problem. (I give DuraTrax credit for spec'ing the stronger-than-standard Hitec HS-605BB servo, but the Quake still needs more power here.)

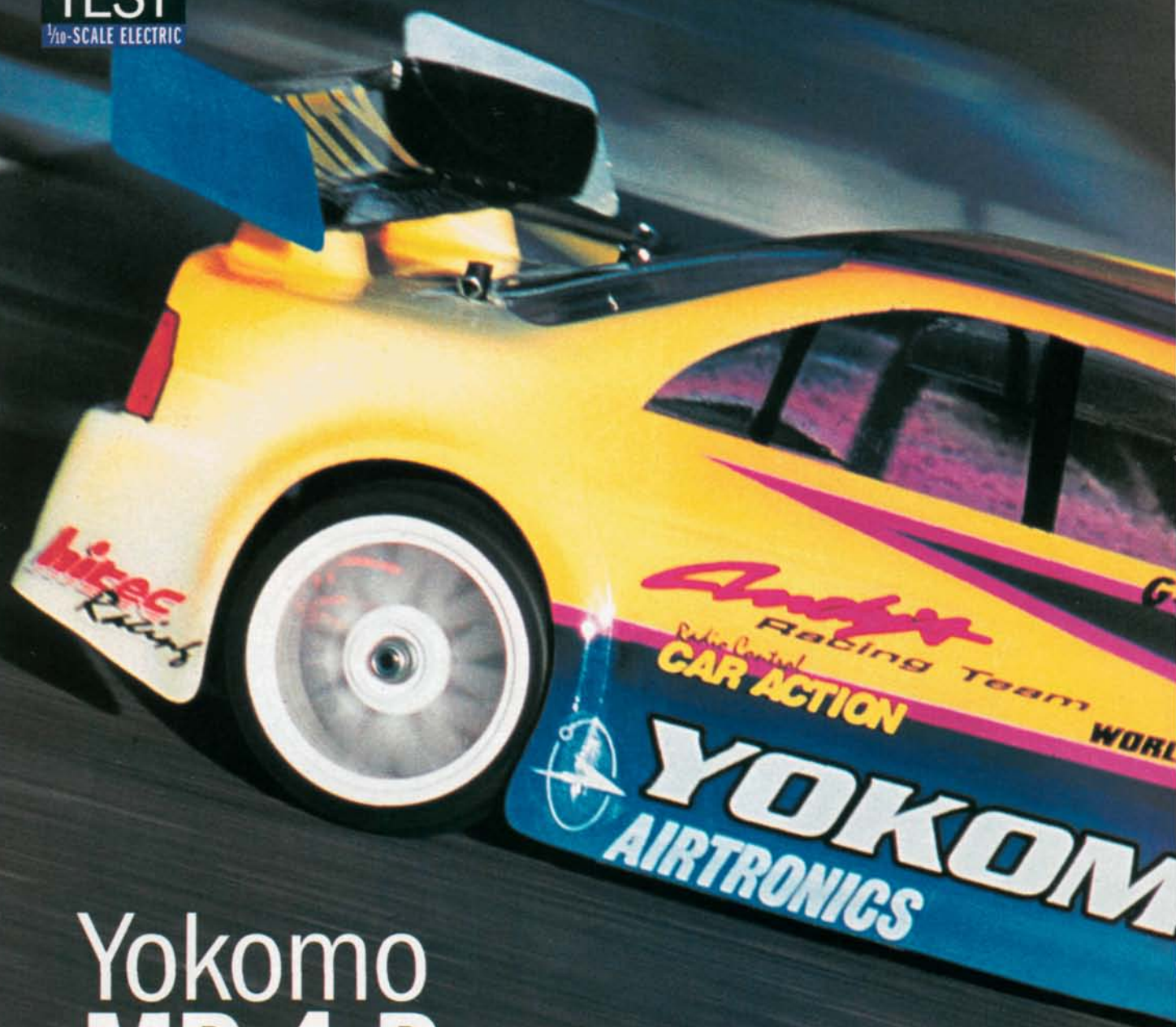
Let me preface the rest of the performance testing by explaining DuraTrax's "Stress-Tech" guarantee. If you break any Stress-Tech plastic part (which covers just about every suspension component), it will be replaced free during the first six months you own the truck. I was feeling a little cocky with the knowledge of that safety net, so I decided to put the Street-Tech parts to the test. The landscaping around the ol' homestead has some nicely shaped embankments that serve as perfect roller jumps, so of course, I sent the truck sailin'. After several jumps that put at least 5 feet of air under the truck, I was pleased to see that not a single part on the Quake had broken, and the chassis was in the same shape as it had been before the flying session. Did I mention that it was 30 degrees outside when I ran the truck? Cold temperatures usually take a toll on plastic parts, but the big Q held up just fine.

THE VERDICT

Despite the minor diff-unloading and servo-strength problems I had with the truck, I had a blast driving it. DuraTrax has assembled a great package. Whether you are new to the RC hobby or have been involved in it for a while, if you're looking for a fast, fun, nitro monster, then check out the DuraTrax Quake.

*Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■

THE COMPETITION	OFNA MONSTER BLAZER	KYOSHO NITRO USA-1	TRAXXAS T-MAXX	DURATRAX NITRO QUAKE
	Wheelbase	13 in. (320mm)	12.38 in. (314.5mm)	12 in. (305mm)
	Width	19.7 in. (500mm)	16.5 in. (419.1mm)	14.8 in. (375mm)
	Weight	142 oz. (4,015g)	147.4 oz. (4,179g)	137.6 oz. (3,901g)
	Diff type	Gear	Gear	Gear
	Brakes	Dual disc	Single disc	Single disc
	Engine	Force .21	Kyosho .21	TRX Pro .15
	Exhaust	Tuned-type	Tuned-type	Tuned-type
	Street price**	\$249.99	\$449.99	\$379.99 (RTR)
	Issue reviewed	5/99	3/92	2/00
**Prices may vary depending on location.				



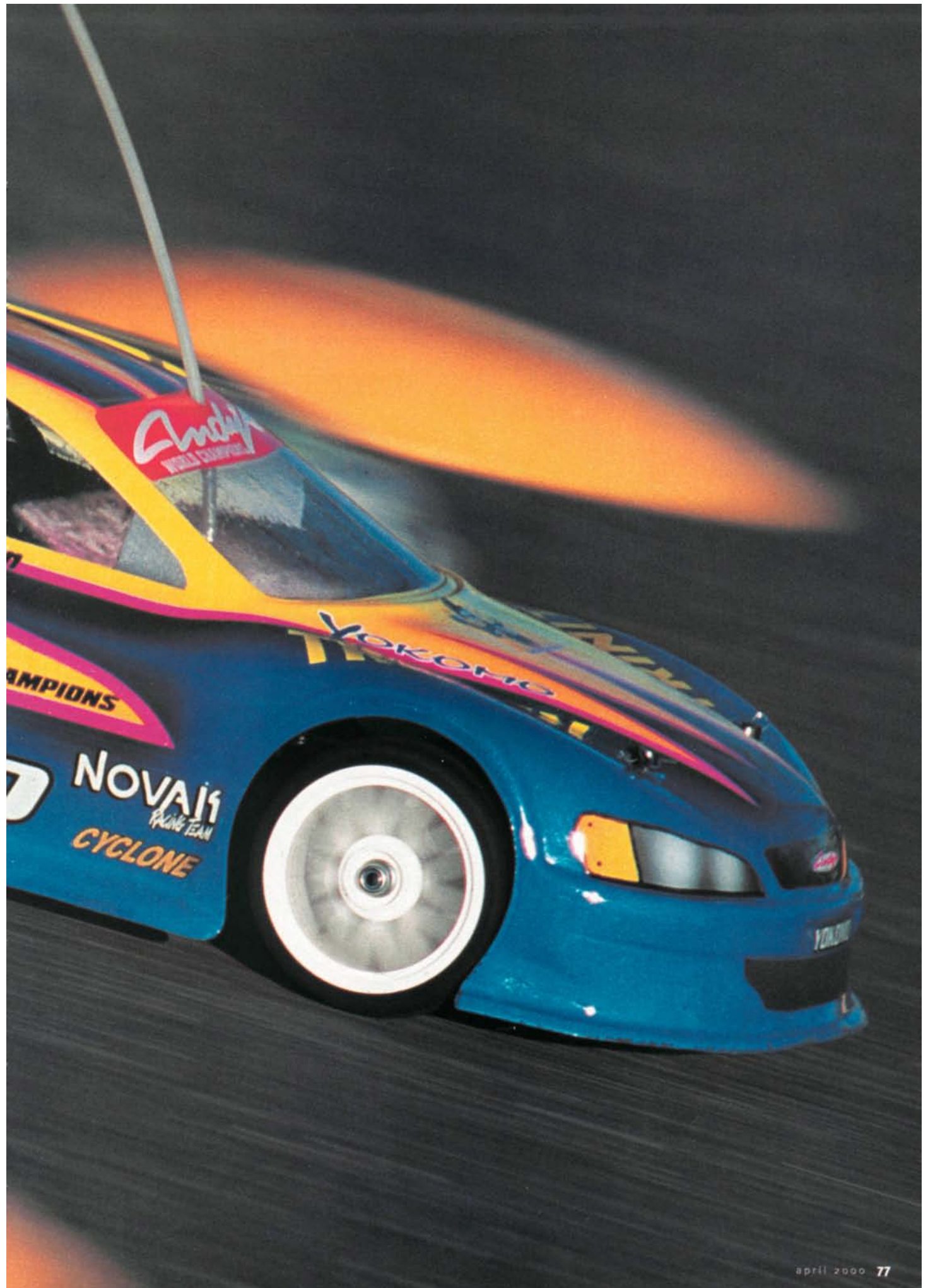
Yokomo MR-4 Pro

Mister 4's Dream Machine

by George M. Gonzalez

Yokomo* pretty much pioneered the electric 4WD-racing segment of the hobby and was first to introduce a competitive electric 4WD touring car. Much has changed since the heady days of the infamous YR-4, but Yokomo has proven that it is still in the forefront of electric touring-car technology with the release of the MR-4TC. Although marketed as a sport-level car, the MR-4TC comes with full bearings, ball diffs and universals. At one time, these features were normally reserved for more expensive, pro-level vehicles; I emphasize "at one time" because many sport-level touring cars are starting to emerge that have these racing features. Because of the MR-4TC's success, Yokomo decided to release a full-race version appropriately called the MR-4 TC Pro, for racers who want a fully optioned car right from the get-go. So how does the new Pro measure up against the competition? Turn the page to find out.

PHOTOS BY WALTER SIDAS



TRACK TEST Yokomo MR-4 Pro

DATA CENTER

Vehicle type: 1/10-scale electric touring car
Best buyer: racers looking for an all-out competition vehicle

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions: good
Parts fit/finish: very good
Durability: good
Overall performance: very good

LIKES

- Extremely rigid chassis.
- Highly tunable suspension.
- Comes with all the goodies, i.e., graphite chassis, aluminum shocks, CV axles, titanium tie rods, composite diff outdrives and much more.
- Supersmooth drive train.

DISLIKES

- The pinion gear is hard to reach, making gear changes a hassle.
- There are no provisions to adjust belt tension.

SPECIFICATIONS

AVAILABLE AT \$219
LIST PRICE \$360

DIMENSIONS

Wheelbase 10.25 in./258mm
Width (F/R) 7.44 in./189mm

WEIGHT

Gross (as tested) 53.75 oz./1530g

CHASSIS

Type Molded tub
Material Graphite composite

DRIVE TRAIN

Type Dual-belt 4WD
Primary Pinion/spur gear
Drive shafts Universal CV
Differential(s) (F/R) Ball
Slipper clutch No
Bearings/bushings Bearings

SUSPENSION

Type (F/R) Lower A-arm/upper camber link
Linkage Titanium turnbuckles
Damping Aluminum-body coil-over, oil-filled shocks

WHEELS

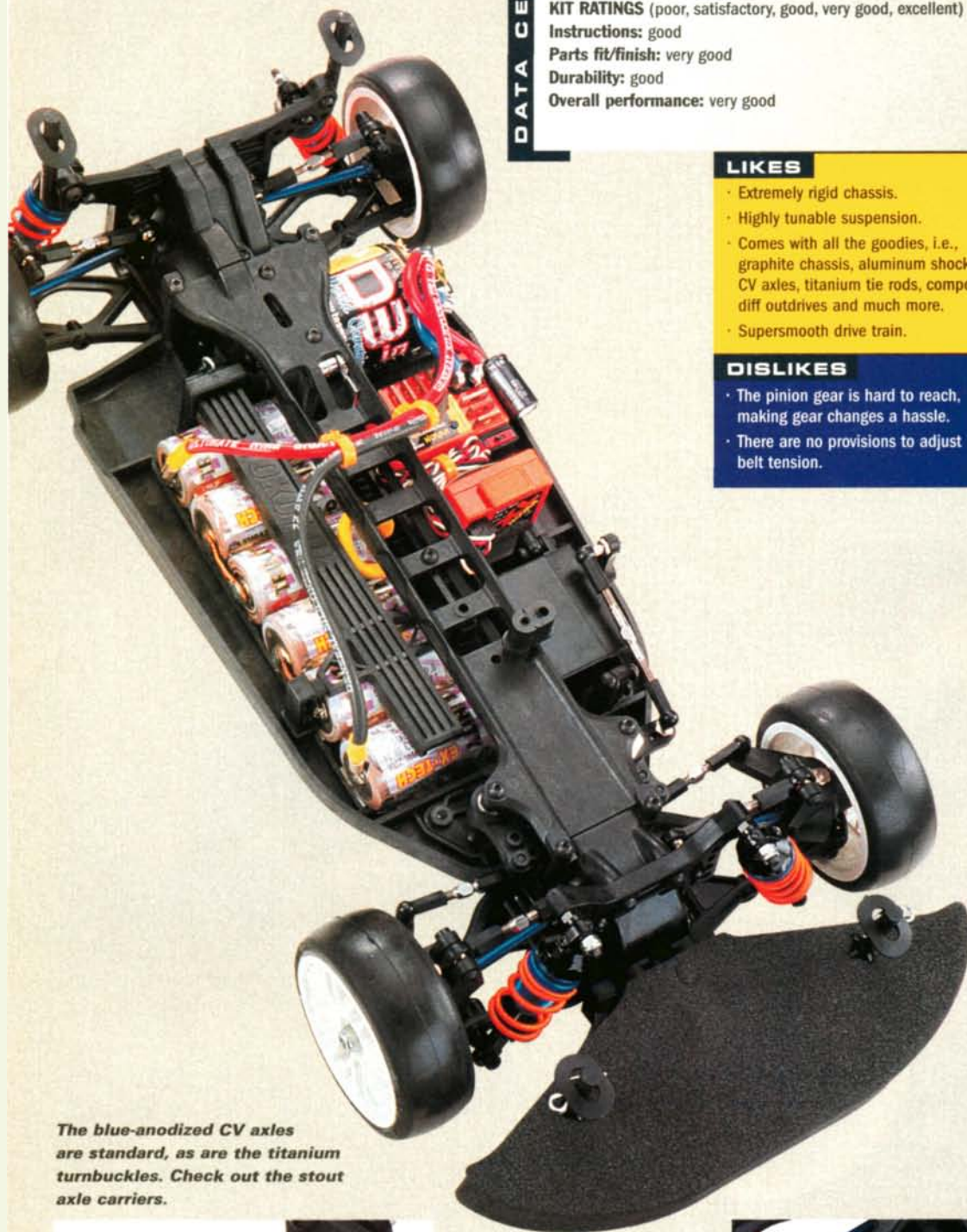
Type Yokomo one-piece plastic mesh
Dimensions (DxW) 2x1 in.

TIRES

Type (F/R) Yokomo Hot Laps slick

ELECTRICS (not included)

Radio system Airtronics CX2P
Receiver Novak XXL 75 MHz FM
Motor Trinity D3.5 10-turn quad
Batteries Trinity EX-Tech 2000mAh matched cells
ESC Novak Cyclone
Steering servo Hitec HS-525MG



The blue-anodized CV axles are standard, as are the titanium turnbuckles. Check out the stout axle carriers.



The Pro includes this thin-aluminum, lower motor heat sink.



KIT FEATURES

Chassis. The Pro includes Yokomo's optional molded-graphite composite, semi-tub chassis as standard equipment. Six battery slots molded on the right side allow a racing-style, side-by-side battery pack to be mounted as low as possible on the chassis to lower the vehicle's overall CG. Stick packs can also be used, but they cannot be mounted as low on the chassis as the side-by-side type. A molded battery strap provides hassle-free battery mounting (regardless of type), or you can use strapping tape to secure the cells to the chassis. Yokomo shows a method that allows you to reuse the same piece of strapping tape again and again.

The Pro also includes Yokomo's new one-piece graphite composite upper deck that is stronger, lighter and more rigid than the 4-piece unit on the MR-4TC and MR-4BC buggy. Unlike the MR-4TC and MR-4BC, the Pro does not include all the pieces neces-

building & setup tips

A 6-page supplement to the instructions covers all of the Pro's unique features. Be sure to read both manuals thoroughly before starting assembly. The manual includes great illustrations, but study all the parts and hardware sidebars because many parts look very similar but are different. The Pro kit comes with a coupon for a free tuning guide from Yokomo; send it in because the tuning guide is invaluable. Here are a few tips that will help you during assembly.

■ **Step 2, pages 4 and 5.** Build the front diff first, and then move on to the rear diff as recommended in the instructions. This will simplify things. Take note that all four diff outdrives are a different shape. Pay close attention to the illustration on the lower left corner of page 5 to identify each outdrive. Use a small Phillips-head screwdriver to insert the 2.6mm locknut into the hex

opening inside the front and rear outdrives.

■ **Step 6, page 9.** Place a drop of liquid thread-lock on the 3x10mm button-head screw that secures the ball-bearing belt guide to the motor mount.

■ **Step 8, page 11.** Install the motor and pinion gear before you continue. It's not that easy to install the pinion gear once the top deck has been secured.

■ **Step 10, page 13.** Slip one short and one long molded servo-saver collar over each of the steering posts before you install the top deck, even though the instructions direct you to install just the short collars.

■ **Step 16, page 19.** Place a drop of liquid thread-lock on the setscrew that secures each of the CV axles.



The molded battery strap is user-friendly. Both stick and side-by-side batteries can be used.

sary to completely seal the drive train, namely, the front and rear dust covers, chassis backbone and Lexan cover. In my opinion, however, the Pro's drive train is well protected from the elements even without these extra precautions, and I would rather have an easy-to-maintain, more rigid chassis assembly than a completely sealed drive train; just keep the Pro on the track, OK?

Drive train. Yokomo carries over on the Pro its trademark low-CG, dual-belt drive train, but special low-friction front and rear drive belts and a blue-anodized aluminum main pulley-gear/spur-gear mount that accepts aftermarket spur gears are Pro exclusives. The Pro's unique dual-belt drive system uses an extremely small and light center layshaft that reduces rotating mass, and the unusually short, rear drive-belt and large main pulley-gear arrangement operates virtually friction free. A provided ball-bearing belt guide routes the long front drive belt through the channeled motor mount and underneath the top deck, but it's not adjustable, and there are no provisions to adjust front or rear

YOU'LL NEED

- 2-channel radio system with receiver and one servo.
- ESC.
- Motor.
- 6-cell battery pack (stick, side-by-side, or saddle).
- Battery charger.
- 190mm body and paint.
- CA for the tires.

FACTORY OPTIONS

Graphite components:

- Front and rear shock towers—part no. ZS017TG.
- Suspension arms (F/R)—ZS008FG, ZS008RG.
- Bulkhead (F/R)—ZS300FTG, SZ300RTG.
- Caster blocks—ZM413G.
- Steering blocks—ZM415SG.

test gear

• **Airtronics CX2P transmitter.** Although this Airtronics* radio is not computer controlled, it has all the features racers need and is extremely user friendly. It also has a removable module, so you can switch from 75Mhz to 27Mhz and vice versa.

• **Novak XXL 2-channel receiver.** Nothing beats the convenience of having more than one receiver. The Novak* XXL performs as well as the factory



equipment and costs much less.

• **Novak Cyclone ESC.** This ESC has been in at least five different vehicles, and it has performed flawlessly in each application.

After two years of hard racing, it still provides extremely smooth throttle response, and the adjustable parameters and Data Link allow me to program it to my liking.

• **Hitec HS-525MG servo.**

This budget-price, metal-gear, ball-bearing Hitec* servo performs as well, if not better than, some units that cost twice as much. With a

transit speed of .12 second and 55 oz.-in. of torque (at 6 volts), it's well suited for serious TC racing.

• **Trinity power.** I wanted this car to be a bullet, so I reached for the most powerful motor and batteries I could get my hands on. I chose Trinity's* D3.5 modified motor because it's the most efficient of the line, and the 10-turn quad wind provides smooth power and incredible rpm. Stout Trinity EX-Tech RC2000 cells gave me the run time I needed to complete a 4-minute race with time to spare.

• **Andy's Accord body.** Many racers have been waiting a long time for this body to be released because it was rumored to provide

more steering than the World Champion Stratus body. Although I don't have scientific data to support my claims, the Pro had an abundance of steering that I had to trim out on my transmitter.

• **Racing rubber.** I equipped the Pro with a complete set of Yokomo Sprint slick tires (firm compound with medium compound molded inserts) and Inch Up wheels. These days there's a lot of hype about miracle tire compounds that offer tremendous traction and long life, but Yokomo's Sprint tires have always provided the best of both. I ran 10 battery packs through the Pro before the tires started to show any signs of wear.

belt tension, which I thought a bit odd.

The Pro features the same 2-piece aluminum motor mount as the MR-4TC, but a finned, aluminum lower heat sink is provided to help dissipate motor heat. Front and rear ball diffs are included, and they feature lighter-than-aluminum composite outdrives that should also help reduce rotating mass. The entire drive train spins on high-quality shielded ball bearings; these may require occasional maintenance, but it's a fact that shielded bearings operate with less friction than sealed units. No doubt, Yokomo left no stone unturned in the friction-fighting department!

The Pro includes a 78-tooth, 48-pitch spur gear and a 22-tooth pinion gear that together yield a 3.54:1 pinion/spur gear ratio. Multiply the pinion/spur ratio by the drive train's 2.2:1 internal ratio for a 7.9:1 final gear ratio. It is well suited for low-wind modified motors, but nothing beats having a selection of pinion gears—especially since the instruction manual doesn't provide any gearing advice.

Final drive is accomplished by front and rear CV axles that are machined from lightweight aluminum to reduce rotating mass, and they're blue-anodized for that cool factory look. In short, the Pro features one of the smoothest and quietest belt-drive systems I have ever tested. My only gripe is that pinion gear changes are difficult unless you have very small fingers. Big-digit racers like me have to remove the top deck to gain access to the pinion gear.

Suspension. The first things I noticed on opening the box were the unusually long front and rear suspension arms. The Pro's narrow front and rear bulkheads and deeply offset wheels allow longer suspension arms, which permit more chassis roll during cornering for increased traction on slippery surfaces. Upper control links allow front and rear camber adjustment. A complete set of Lunsford titanium tie rods and a handy tie-rod wrench are also included.

The front suspension arms are kicked up 2 degrees, and when combined with the 5-degree caster blocks, attain a total of 7 degrees caster. The rear arm mounts provide 2 degrees of anti-squat, and the rear axle carriers each have .05 degrees, for a total of 1 degree of rear toe in. Optional front caster blocks and rear axle carriers are available to change the amount of front caster and rear toe-in. In addition, two suspension-arm mounting locations on the front and rear bulkheads allow independent front and rear roll-center adjustment.

The molded front and rear shock towers are the same highly adjustable units as on the MR-4TC. The front tower has three upper shock-mounting locations and six inner control-rod mounting options, while the rear tower has five upper-shock and seven inner-control-rod mounting locations to choose from. Additionally, the front and rear suspension arms also include two lower shock mounts.

Yokomo's optional—and extremely trick—blue-anodized aluminum shocks with threaded shock bodies and internal volume compensation are standard on the Pro. The shocks are a little messy to assemble, but they operate very smoothly and don't

require frequent maintenance, thanks to the foam volume-compensating pads that prevent the shock fluid from foaming up inside the shock bodies. The molded shock caps have small holes to allow shock oil bleeding, and small 2x5mm self-tapping screws seal up the holes after the shocks have been adjusted. The Pro also includes firm Orange powder-coated springs for all four shocks, three piston choices and heavy-silicone shock fluid.

Steering system. The MR-4TC's dual-bellcrank steering system is carried over, but the Pro includes ball bearings for the bellcranks. The new upper deck also allows you to crank down on the 2mm cap-head screws that secure the upper deck to the steering bellcrank posts without binding up the steering action. The Pro also includes Lunsford titanium tie rods for the steering drag link and steering arm; nice touch!

Wheels, tires and more. As with most expert-level RC kits, the Pro does not include a body. That's OK; I prefer to choose my own anyway. Andy Jacobson of Andy's Racing Products* spent months testing and perfecting the company's new Accord 190mm TC body, and I was one of the lucky few to receive a pre-production shell, which Andy custom-painted for the this "Track Report."

The Pro does come equipped with a complete set of slick tires, inserts and white mesh wheels, but the tires are better suited for play because of their long-wearing compound. It would have been nice if the kit included Yokomo Inch Up wheels and Sprint slick tires (with firm foam inserts, of course) to live up to the Pro's designation.

PERFORMANCE

It's a privilege having an indoor racing facility with an asphalt on-road track and a well-groomed off-road track nearby. Only one place in Southern California offers both on-road and off-road racing under one roof—So Cal Raceway in Huntington Beach. My Pro was box stock with the exception of a complete set of Yokomo Sprint tires with medium compound molded inserts and Inch Up wheels—a combination that works well at this track (and many others).

After a few slow laps to get a feel for the car and the track, I started to speed things up. The Trinity 10-turn quad speeded things up in a hurry, but the Pro sucked up the abundance of power and put it down evenly on the asphalt. The Pro was extremely stable on the long back straightaway, and I only momentarily let off the gas at the entrance of the banked sweeper to keep a tight line going through. The Pro had a noticeable oversteer at lower speeds and a slight push at the limit, but after tinkering with the end-point adjustments and adding some negative exponential on my radio, the Pro was ready for battle. The folks at Yokomo really did their homework: I didn't have to make a single adjustment to the suspension to get the car dialed on the track.

THE VERDICT

The MR-4TC raised the bar in the sport-level segment as a value-packed touring-car kit with many pro-level features. By including a host of factory hop-ups, the MR-4TC platform is now on par with the best pro-level touring cars on the market. Despite my few criticisms, the Pro handled well above my expectations, and I'm confident that with more time behind the wheel, this car just might show me the path to the winners' circle. My hat's off to Mister 4; he really knows how to build a 4WD car!

*Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■

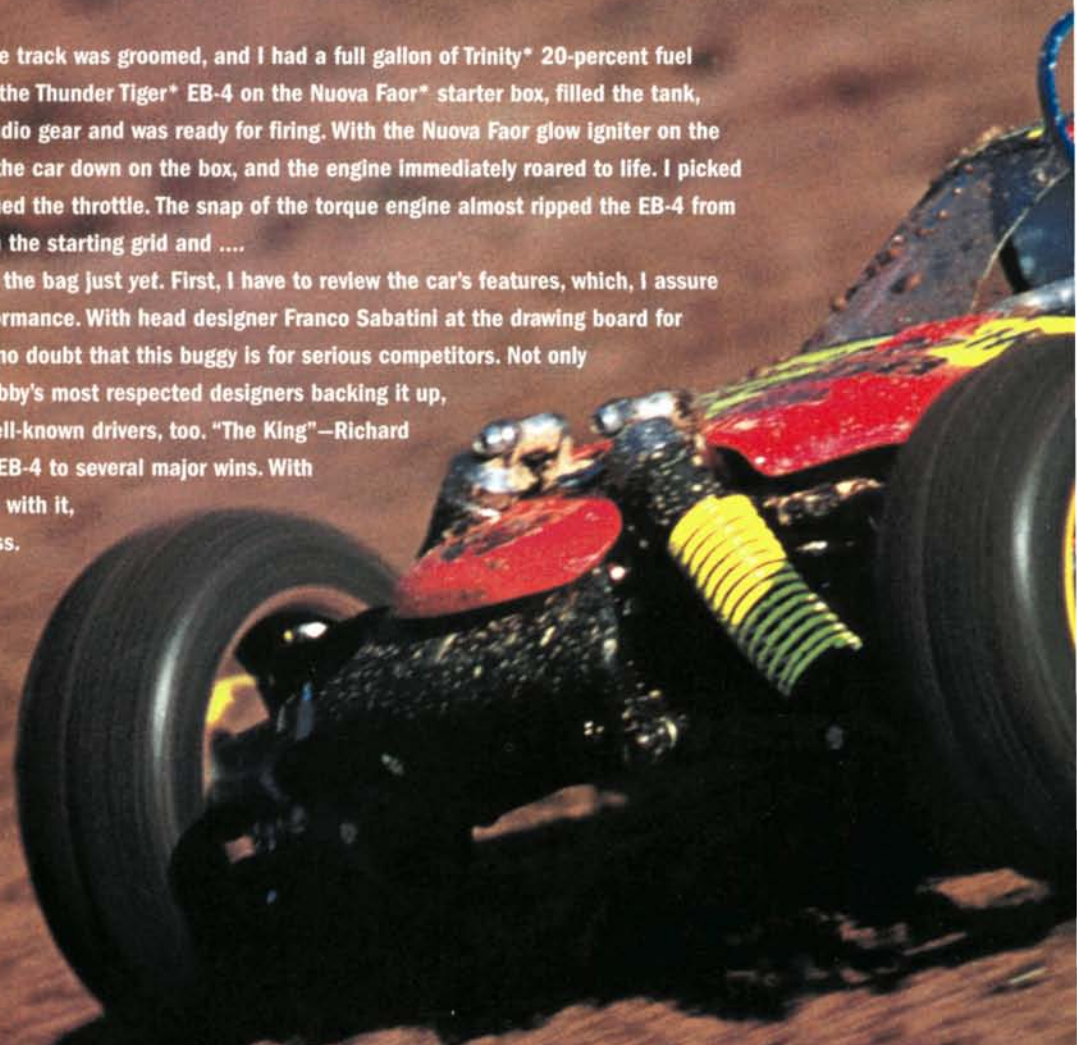
THE COMPETITION		ASSOCIATED TC3 (TEAM)	HPI RS4 PRO 2	SCHUMACHER SST 2000 '99	YOKOMO MR-4TC PRO
	Wheelbase	10.18 in. (259mm)	9.88 in. (251mm)	10 in. (254mm)	10.25 in. (258mm)
	Width (F/R)	7.44/7.48 in. (189/190mm)	7.2/7.4 in. (183/188mm)	7.25 in. (184mm)	7.48 in. (189mm)
	Diff type	Ball	Ball	Ball	Ball
	Chassis	Molded tub	Graphite	Fiberglass	Molded-graphite tub
	List price	\$369	\$399	\$369	\$360
	Street price*	\$219	\$229	\$225	\$219
	Reviewed in	2/00	5/99	4/99	4/00
	Partial list only; product category is too large to list all competitive vehicles				
	* Prices vary with location				

TTR EB-4

Hit the track with the latest 1/8
Worlds contender by Greg Vogel

It was a perfect test day; the track was groomed, and I had a full gallon of Trinity* 20-percent fuel waiting to be burned. I set the Thunder Tiger* EB-4 on the Nuova Faor* starter box, filled the tank, switched on the Futaba* radio gear and was ready for firing. With the Nuova Faor glow igniter on the Omega* engine, I pressed the car down on the box, and the engine immediately roared to life. I picked up the car by its wing and punched the throttle. The snap of the torque engine almost ripped the EB-4 from my hand. I dropped the buggy on the starting grid and

Aww, I can't let the cat out of the bag just yet. First, I have to review the car's features, which, I assure you, are just as good as its performance. With head designer Franco Sabatini at the drawing board for the Thunder Tiger EB-4, there is no doubt that this buggy is for serious competitors. Not only does this car have one of the hobby's most respected designers backing it up, but, perhaps, one of the most well-known drivers, too. "The King"—Richard Saxton—has already piloted the EB-4 to several major wins. With names such as these associated with it, this buggy is sure to be a success.



PHOTOS BY WALTER SIGAS



Thunder Tiger spared no expense when it chose a foundation for its new competition buggy.

DATA CENTER

Vehicle type: 1/8-scale, nitro, 4WD competition off-road buggy
Best buyer: racers or performance-minded enthusiasts who need a competition-level kit with full tuning potential

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions: good
Parts fit/finish: very good
Durability: very good
Overall performance: very good



SPECIFICATIONS

SCALE 1/8
PRICE \$418

DIMENSIONS (chassis only)
Width (F/R) 10.24 to 10.55 in. (260 to 260mm)
Wheelbase 12.96 in. (324mm)

WEIGHT
Gross, RTR 120.5 oz. (3,420g)

CHASSIS
Type Plate with kick-up and radio tray
Material Aluminum

DRIVE TRAIN
Type Shaft-driven with gearbox
Primary Clutchbell/spur
Drive shafts Front: universals; center and rear: dogbone
Differential(s) Sealed bevel-gear
Bearings/bushings Bearings

SUSPENSION
Type (F/R) Double A-arm/lower arm with adjustable upper link
Damping Oil-filled, coil-over shocks

WHEELS
Type One-piece, 5-spoke

TIRES
Type Cubic tread

ENGINE AND ACCESSORIES (not included)
Engine Omega X6 Super Buggy
Carburetor 2-needle
Manifold Omega
Pipe Omega EFRA 069

ELECTRICS (not included)
Radio Futaba 3PJ PCM
Steering servo Futaba Digital
Throttle servo Futaba 9601
Receiver battery Orion 1000mAh

LIKES

- Rigid chassis design.
- Sealed-steel gear differentials.
- Clean, easy-to-maintain chassis layout.
- Fully tunable.

DISLIKES

- Suspension arms flex too much for my liking.

KIT FEATURES

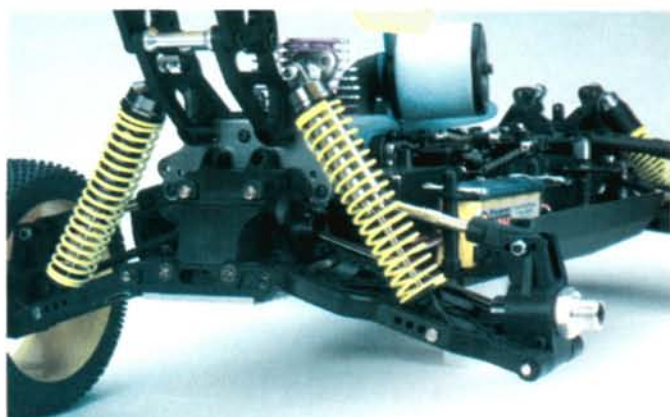
• **Chassis.** Thunder Tiger spared no expense when it chose a foundation for its new competition buggy. Sturdy, 3mm-thick aluminum was spec'd for the chassis, the shock towers and the steering plate. The chassis is countersunk with a kick-up and, like the rest of the aluminum components, is polished and anodized gray. A plate that spans from the front gear case to the steering posts serves as a front-end stiffener with a tie rod extending to the center bulkhead's upper plate as extra support. A short servo plate helps serve as a backbone for the chassis, as it links the center bulkhead and aluminum chassis standoffs. Just four screws hold the plate down. Too few, you say? I bet you'll change your mind during scheduled maintenance. All of the radio gear is fairly easy to remove; only two body clips hold in the receiver, and four screws support the radio box. The last of the stiffening components is a hefty aluminum tie rod that extends from the rear bulkhead to the chassis.

A 125cc fuel tank is mounted in front of the engine and wraps around the center bulkhead. Deflector plates inside the tank prevent the fuel from sloshing around and foaming.

• **Suspension/steering.** The EB-4 features a front end that has strayed from its predecessors' design; it has a pivoting, cast-aluminum steering knuckle that eliminates a hub carrier from the car. Two large pivot balls captured within two ball cups on the upper and lower arms secure the knuckle in place. The upper and



The steering knuckle is attached directly to the arms. Small clips on the inside of the upper arm are used to adjust caster. Adjustable tie rods are also provided for toe and camber change.



If you look closely, you'll notice a little clip on either side of the hub. By moving these clips to the front or back of the hub, you can slightly alter the car's wheelbase. Several rear pivot blocks are also included with the kit to change rear toe.

building & setup tips

The instruction manual is very detailed and includes an addendum sheet to aid you in the building process. To improve race potential and provide set-up tips for various race conditions, a racers' tip sheet is also supplied.

■ The EB-4 has O-ring-sealed diffs, but it does not include silicone diff fluid. I filled the diffs with OFNA silicone differential fluid—7,000WT up front, 10,000WT in the center and 1,000WT in the rear.

■ The Omega tuned pipe and header that I installed required some modification to fit the engine. Using a hacksaw, I removed 3/4 inch from the header. Test-fit the pipe and manifold you choose before assembly.

■ For added protection against dirt and dust, I sealed the bottom of the diff cases with silicone. A thin bead around the base is all you'll need.

■ Loctite* is your friend; use it.

■ A single zip-tie looped through the fuel tank's cap makes an excellent handle for your pit crew to grab during a pit stop.

■ When you mount the stock tires to the rims, be sure to wipe the rubber bead and rim with alcohol to remove the mold-release oils. It's also a good idea to scuff the areas with sandpaper or a Scotch-Brite pad before you do any gluing.

■ To protect the receiver from vibration, pack the radio box with sponge foam.

YOU'LL NEED

- 2-channel radio.
- Two servos, preferably high-torque.
- Receiver battery.
- Engine.
- Pipe and manifold.
- Differential fluid.
- Starter box.
- Glow-starter.
- Fuel.
- CA glue.
- Paint.
- Thread-lock compound.

lower ball cups can be threaded in or out equally to adjust track, or the upper tie rod can be adjusted alone for camber change. I was impressed by the quality of the kit up to this point but then became a little leery of some of the EB-4's components. The suspension arms, which look somewhat toy-like, are rather flimsy when compared with other race buggies. They may not break easily in a crash, but the flexing may

test gear

• **Futaba 3PJ transmitter.** This transmitter has it all: absolutely everything you could ever need to dial in your buggy. It features 10-model memory, adjustable throttle and steering expo, and more. Besides the fact that it's feature-packed, the grips are very comfortable, and you'll welcome this during a long Main.

• **Futaba digital servo.** Need high-powered, quick steering? Look no farther. This servo can turn the wheels of a big car such as the EB-4 at lightning speed.



• **Orion* 1000mAh receiver battery.**

When you run digital servos in a one-hour Main, you need all the juice you can get. Orion's battery gets the job done.

• **Omega engine, header and pipe.** This lethal combination should make the buggy rocket



down the straightaways. The engine I dropped in here was hand-tuned by Eduardo Picco himself. Can you say "extra Loctite on the engine mounts"?

TRACKTEST Thunder Tiger EB-4

hamper handling. On a more positive note, the upper hinge for the A-arm allows caster adjustment with several adjustment clips. Rear toe changes are accomplished with several toe blocks that are included with the kit. Swaybars are also included.

Visible under the upper bulkhead brace is the steering system. Bellcranks—one of which is spring-loaded to act as a servo-saver—are tied together with a thick, aluminum tie bar, at the end of which are three holes for steering-response adjustments.



Above: the steering bellcranks have a built-in servo-saver that protects the servo from damage. If you look closely at the tie bar that connects the cranks, you'll notice three holes for the steering tie rod. Selecting different holes changes the responsiveness of the steering.

Right: stamped-steel brake discs slow the car with the help of padded plates actuated by the upper and lower cams shown here. Thunder Tiger uses a steel main gear on the sealed center diff.



• **Drive train.** Looking at the outside of the differential cases, it appears that Thunder Tiger retained the drive system used on the Mirage buggies. Not so, though; inside the cases are sealed bevel-gear differentials supported by ball bearings. The differentials feature fiber discs to adjust the amount of gear play. These spacers go between the diff's case and the ring gear, unlike other differential systems that use washers on the outdrive shafts to set gear spacing. The gears inside and outside the diff are composed of hardened steel that's ready to withstand the rigors of hardcore racing. The center differential also features a steel spur gear, and the outdrives support the steel brake discs. Traditional cams press against the fiber-padded brake plates. Dogbones transfer the power from the center diff to the front and rear gear cases, as well as to the rear wheels. Universals are standard equipment up front, however.

• **Wheels and tires.** New, stiffer—and better-looking, I might add—rims bolt up to all four corners. During bench-testing, they seemed stronger and less susceptible to shattering during a run than the older Thunder Tiger rims; the track will tell. Shaped foam inserts are provided to retain the tires' shape while in motion. Thin, two-sided tape is supplied to stick the foam to the rim so it doesn't bunch up. Challenge* Cubic race tires are wrapped around each rim.

• **Body and wing.** A yellow, single-piece wing is clipped to adjustable wing mounts. Body clips now tie down the wing instead of large E-clips. I don't know about you, but I'm glad they got rid of the E-clips; they always fell off after a few flips. The body resembles that of the Mirage; it is square with a large cockpit, but the new body has been slightly altered and has louvers on the sides.

PERFORMANCE

Before I hit the track, I broke the engine in at home. It was rather cold outside, and I had to heat the engine with a heat gun just to get it to turn over on the starter box. As soon as fuel got into the engine, though, it fired up and never quit. I ran two tanks at an idle and two tanks running the car around the yard at half throttle. Then it was time for the track.

The test site was Xtreme R/C in New Milford, CT. They have expanded and widened the track just enough for 1/8 cars to run. I fired down the straight and nailed the brakes for the killer, 90-degree turn. The EB-4 stayed perfectly stable, and I was able to carry quite a bit of speed through a corner that many drivers have difficulty conquering. A decent-size jump with a lip lay ahead, with a corner directly after it. By tapping the brakes, I was perfectly able to get the nose down, and I went through the corner. I found the car to be very responsive to my commands.

The track surface was packed, yet there was some loamy dirt on top. The stock rubber gripped well, but I changed over to Pro-Line Multi-Spike tires on Nuova Faor mesh rims. The buggy was completely dialed, and I laid down some quick lap times. There's a rough whoop section in the center of the track that's well-known for tossing electric vehicles into the weeds. The EB-4 fared well through it, though, and was only tossed once in a while. I found the EB-4 to be very consistent, and I didn't break a single part in the cold weather test (although I never hit anything, nor did I try to).

THE WRAP-UP

So to answer the question, is this a true competition buggy? Absolutely. Judging by its features and geometry, its performance at the test track and the multiple titles it has acquired after only a few months of racing, it is a true, competition vehicle. A field normally dominated by Mugen and Kyosho buggies now must be shared with the new EB-4. Besides its race-winning potential, the EB-4 also could be an excellent bargain for the first-time buggy buyer; it's priced at around \$410, which is much less than the aforementioned cars sell for. Keep an eye out for these cars; they'll be taking over a track near you.

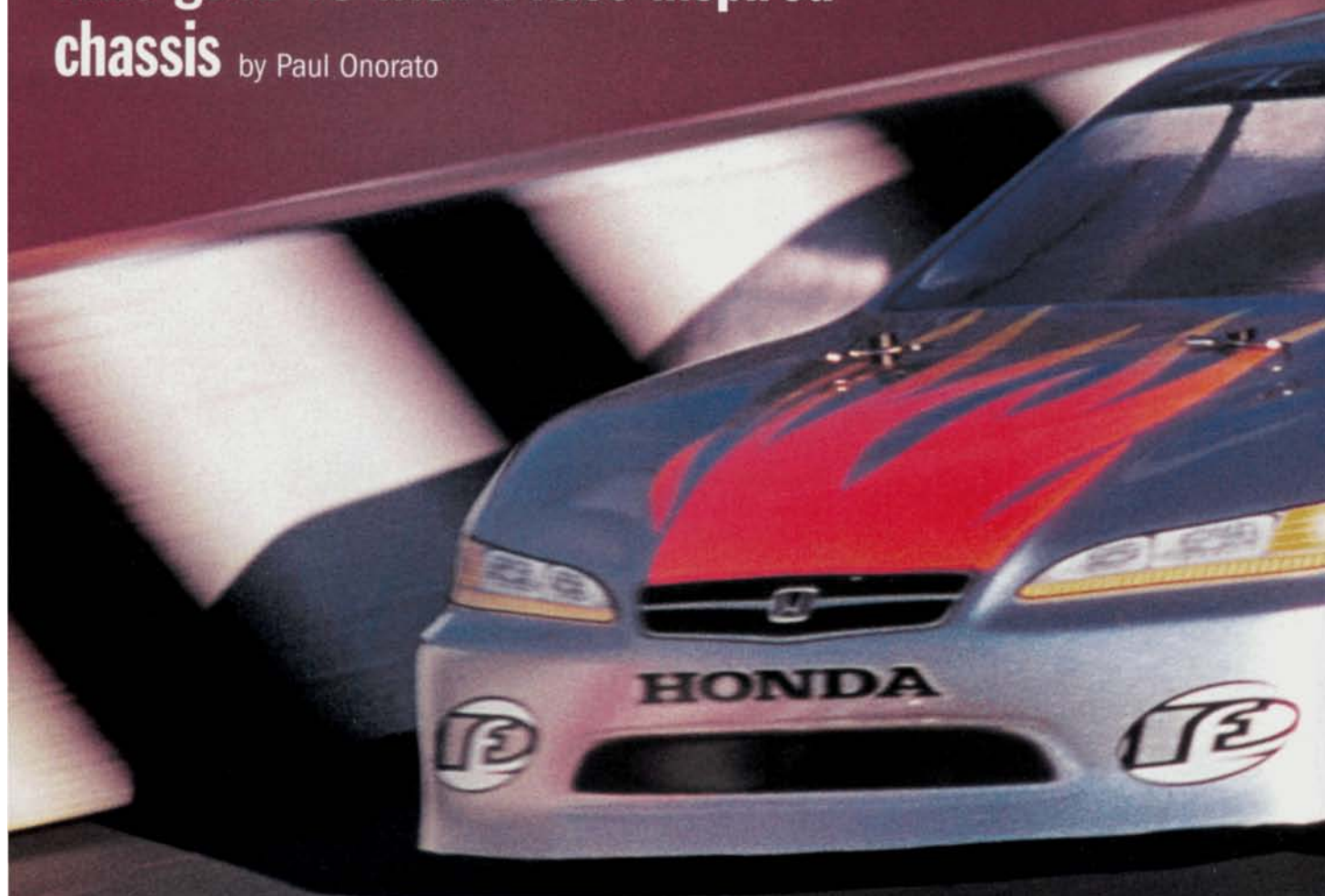
*Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■

THE COMPETITION	OFNA	Kyosho	Thunder Tiger	Mugen
	Ultra Worlds II	MP-6	EB-4	MBX-4
Wheelbase	12.92 in. (323mm)	13.3 in. (331mm)	12.96 in. (324mm)	13 in. (325mm)
Width	12.02 in. (305mm)	11.93 in. (318mm)	10.6 in. (265mm)	12 in. (306mm to 310mm)
Weight	112 oz. (3,175g)	113 oz. (3,203g)	115.5 oz. (3,274g)	119 oz. (3,373g)
Diff type	Sealed	Sealed	Sealed	Sealed
Brakes	Steel	Steel	Steel	Steel
Exhaust	Pipe	Not included	Not included	Not included
Street price**	\$369.99	\$449.99	\$409.99	\$429.99

**Prices may vary depending on location.

MRC/Academy **STR-4**

MRC goes TC with a race-inspired chassis by Paul Onorato



PHOTOS BY WALTER SIDAS



MRC/Academy* enters the touring-car battleground with the release of the STR-4. Rather than follow the dual-belt trend, Academy chose to go with the less common and seemingly controversial shaft-drive system. The controversy over shaft drive stemmed from Associated's decision to base its long-awaited TC3 around a shaft system despite the proven success of belt setups. Academy must have liked Associated's thinking, as the STR-4 bears more than a passing resemblance to the TC3. There are, however, two very significant differences that overshadow the technical similarities: the Academy STR-4 has a smaller price tag and arrives 90 percent assembled, complete with motor and wiper speed control. Given the object of Academy's sincerest form of flattery, I have to wonder if the STR-4 is more than just an entry-level cruiser; there's one way to find out.

Vehicle type: 1/10 scale, electric, 4WD entry-level touring car
Best buyer: beginning hobbyist

KIT RATINGS (poor, satisfactory, good, very good, excellent)
Instructions: good
Parts fit/finish: very good
Durability: very good
Overall performance: good

LIKES

- 90-percent factory-assembled.
- Sturdy construction.
- Motor and speed control included.
- Many aftermarket goodies.

DISLIKES

- Slight modifications needed for radio installation.
- Packaging of kit damaged my body.
- Limited spur-gear choices.

SPECIFICATIONS

SCALE 1/10
STREET PRICE \$129

DIMENSIONS

Length overall 14.9 in. (380mm)
Wheelbase 10.1 in. (257mm)
Width 7.3 in. (187mm)

WEIGHT

Gross, as tested 51 oz. (1445g)

CHASSIS

Type Tub
Material Molded plastic

DRIVE TRAIN

Type Shaft-drive 4WD
Primary Pinion/spur
Drive shafts Dogbones
Differential(s) Bevel gear
Bearings/bushings Bushings

SUSPENSION (F/R)

Type Lower suspension arm with upper link
Damping Oil-filled shocks

WHEELS

Type One-piece plastic

TIRES

Type Rubber street tread

ELECTRICS

Motor 540 type
Battery Not included

ESC

Mechanical/wiper-arm

As a whole, the drive train is a nice clean package; there are no belts to stretch or become fouled with debris; the sealed differentials keep harmful dust out, and a low parts count helps reduce maintenance and kit cost.



The suspension arms are full of strengthening webs and appear very durable. The fixed camber link and Oilite hub bushing is visible as well.

KIT FEATURES

• **CHASSIS.** The STR-4's foundation is a semi-tub chassis made of fiber-reinforced plastic. The chassis' turned-up sides, coupled with front and rear braces, help reduce flex. A stiffening rail is molded into the chassis and runs almost its entire length, further contributing to fore/aft rigidity. All of the screws are countersunk, or recessed, into the chassis for a smooth undercarriage, and a molded bumper at each end of the car protects it from hard knocks. Since the central drive shaft effectively splits the chassis, it makes sense to place the battery pack on one side of the chassis and mount all of the electronics on the other half. The STR-4 places the batteries (stick pack or side by side) on the right side. The battery tray also allows for weight adjustment by sliding the battery toward the front or the rear. Two included foam blocks prevent the battery from sliding out of position; removing it between runs is quick and easy: remove one body clip, disconnect the battery plug, and it is out.

building & setup tips

Before you put the finishing touches on any pre-assembled kit, check that all the hardware has been tightened, except for the camber-link screws. If these are fully tightened, it will bind the suspension travel. Back out each ball link a few turns to allow for unhindered travel.

Check the solder joints on the mechanical speed control and motor. The negative lead on the motor in my kit was loose, and I had to resolder the connection.

■ Steps 6 and 7. When you install the radio gear onto the chassis, some modification may be necessary, depending on your radio system. The speed-control mount that houses the mechanical speed control and throttle servo needs slight alteration. When you use a standard-size servo, there is not enough room for the servo lead in the speed-control mount. With a cutting wheel on a rotary tool, remove some of the material between the posts of the mount, allowing space for the servo lead.

I also added one washer to each of the four screws that attach the

servo to the speed-control mount. The holes did not match up exactly between the throttle servo and the mount, but adding the washers to the surface area corrected the problem.

The steering servo has a problem similar to that of the throttle servo: clearance for the lead is extremely tight because of the location of the antenna tube mount; it fits very snugly. Also, the height of most standard servos is just a hair too tall. It interferes with the steering linkage. I removed a little material from the servo housing, and this allowed unobstructed motion.

■ Step 8. When using the stock mechanical speed control, the receiver on/off switch needs to be soldered to the MSC. Be sure to measure the distance from where you will mount the receiver switch to the MSC so that the switch lead is long enough.

If you don't want to alter the receiver switch and you have the male end of a plug from another MSC, you can solder the male plug to the MSC and leave your receiver switch unchanged.

• **DRIVE TRAIN.** Straightforward is a good description of the STR-4's drive train. You cannot help noticing the drive shaft running down the middle of the chassis, instead of the more common belt-drive systems of other popular touring cars. The shaft, constructed of fiber-reinforced plastic, is mounted as low as possible on the chassis for a low center of gravity. The STR-4's included 540 motor should not cause problems for the shaft, but if you want more punch and drop in a modified, there will undoubtedly be some twist (Academy offers two aftermarket shafts—one made of aluminum and the other out of carbon—for this type of use). At either end of the drive shaft are planetary gear differentials, an unusual departure from the bevel-gear standard. The STR-4's gear diffs are not as desirable as ball diffs from a pure performance standpoint, but the gear units reduce the need for maintenance (and are also easier to assemble, which allows Academy to offer factory assembly without making the car expensive). Metal dog-bones exit the diffs to get the juice out to the four wheels.

As mentioned, a 540-type motor gets the STR-4 rolling. A plastic mount holds the motor, which is installed parallel to the drive shaft. A supplied 48-pitch pinion mates with the spur gear that is mounted to the drive bevel of the rear gearbox. Three screws hold the motor mount in place. By loosening the screws, the motor mount slides for mesh adjustments or pinion swaps.

As a whole, the drive train is a nice clean package; there are no belts to stretch or become fouled with debris; the sealed differentials keep harmful dust out, and a low parts count helps reduce maintenance and kit cost. A set of bearings would be nice; however, the stock metal bushings are adequate but don't allow the drive train to spin as freely as it could.

• **SUSPENSION** Coil-over, oil-filled shocks damp the STR-4's suspension. The shock bodies are made of the same fiber-reinforced plastic as the chassis, with single-hole pistons riding inside. Snap-on clip spacers adjust spring preload. Academy went a step further and added multiple mounting holes for the shocks: two holes in the A-arms and three in the shock tower. Beefy A-arms, attached with captured hinge pins, support each of the hub carriers. The rear hub carriers are

YOU'LL NEED

- 2-channel radio system with receiver and two servos.
- 6-cell stick- or saddle-pack battery.
- Battery charger.
- CA for tires.
- Polycarbonate paint.

FACTORY OPTIONS

- Ball differential set—part no. ST-T01.
- Slipper clutch set—ST-T02.
- Universal shaft—ST-T06.
- Center one-way joint cup—ST-T10.
- Front and rear stabilizer—ST-T26 and ST-T27.
- Foam bumper—ST-T35.

Aluminum parts:

- Motor mount set—ST-T03.
- Spur gear adapter—ST-T04.
- Wheel hubs—ST-T05.
- Center drive shaft—ST-T11.
- Ball pins (purple)—GRT-T12.
- Tumbuckle rod (28mm)—GRT-T17.

Carbon parts:

- Center drive shaft—ST-T12.
- Front upper plate—ST-T23.
- Rear brace—ST-T24.
- Battery strap—ST-T25.

test gear

• Airtronics Rival radio set.

Inexpensive, comfortable and durable, the Rival is a great first transmitter and a good match for the STR-4. Although it lacks the tuning features of more expensive transmitters, these features aren't missed by beginners.



• Airtronics 94102 servos.

These are included with the Rival, and they're fine for any 1/10-scale sport vehicle. I installed two servos: one for the steering and one for the kit's included wiper speed control.

• DuraTrax 1500mAh stick pack.

Just basic stuff here; Sanyo 1500 cells are as reliable as ever, and DuraTrax builds a nice pack at a fair price.

• Trinity Speed Gems

Sapphire modified motor. You don't need to buy a motor to get the STR-4 rolling, but the included 540 motor is hardly an exciting powerplant. The Sapphire supercharges the car, but it's too much for the included mechanical speed control. If you plan to install anything hotter than a competition stock motor, upgrade to an electronic speed control.

2.2 TTR

DuraTrax

DuraTrax's selection of truck treads adds a lot of character to your vehicle. With the exception of the Street Trac, all are offered in one hard compound



STEP SPIKE

Compound: hard

Application notes: like the other DuraTrax tires, the Step Spikes are more about looks and longevity than performance. They work OK (and last forever) on grass and thick, loamy stuff, but feel free to run them anywhere. Although conservative compared with the other DuraTrax spikes, the Step Spikes' real appeal is the tough-guy look they give your truck.

OFFSET SPIKE

Compound: hard

Application notes: another anything-goes tread, with even bigger, burlier knobs than on the Step Spikes. If you plan to run in the woods or over grass, these could be your tires.

SLANT SPIKE

Compound: hard

Application notes: with widely spaced, pencil-eraser-size knobs, these "tires of death" are just the things for your RC Road Warrior-mobile. Like the Offset Spike, this tire works best in grass and on trails.

Spikes to step-pins to street: more

TIRE

by Peter Vieira

Tire Mounting Tips

■ **Think clean.** Wipe down the bonding areas of the rim and tire with denatured alcohol or motor spray, or toss everything into a sink full of warm soapy water, rinse and let the parts air dry (that last one is for you patient types). The goal is to remove any mold-release agents that might prevent a good bond.

■ **Trial-fit before you glue.** If the tire's bead doesn't want to drop between the rim's flanges easily, adding glue certainly won't help. If necessary, trim the bead with a pair of scissors to achieve a good fit.

■ **Vent the rims.** Most rims already have a hole that allows air to circulate in and out of the tire, but if yours doesn't, drill one. If the rim has vent holes between the tire mounting flanges, they'll be sealed

off when the tire is glued on; drill a hole in the middle of the rim's width for proper venting.

■ **Use good-quality tire CA.** Pro-Line, Trinity and Team Losi all offer high-quality CA meant for gluing tires. Don't use hardware store "crazy" glues. They're terrible.

■ **Go easy on the glue, and take it slow.** Peel back

PHOTOS BY WALTER SIDAS

U K K



that allows you to blast around on the street without wasting your knobs. These aren't high-performance tires, but they are a lot of fun.



FRONT RIB

Compound: hard

Application notes: all DuraTrax tires have a place on some truck, somewhere, but this front tire with its low-profile sidewalls, thick ribs and flat carcass is downright weird. If you like the look, go for it.



STREET TRAC

Compounds: hard, soft

Application notes: the Street Trac design has a very nice dirt-track look, and the "soft" compound, while still on the hard side compared to other brands, will hook up pretty well. For street action, these are fun tires, and the two compounds help you dial in your traction.

HARD SLICK

Compound: hard

Application notes: if you're after a gumball drag-slick look, these tires are awesome. They're also as hard as granite, so they should last and last. Obviously, this tire is strictly for street.

LO-PRO RACING PIN SPIKE

Compound: hard

Application notes: the Lo-Pro tire is DuraTrax's closest match to a real racing tire, but because of the extremely hard compound, it's still best suited to play. The widely spaced knobs are good for soft, "fluffy" dirt and any type of backyard terrain.

SPLIT V-SPIKE

Compound: hard

Application notes: for a monster-truckish look, this sorta-chevron tire combines a bar-tire design with joined knobs. Strictly for play and sure to offer budget-stretching long wear.



DIAMOND SPIKE

Compound: hard

Application notes: with plenty of knobs arranged in a cross-hatch pattern, this tire should be able to move a fair amount of dirt for decent traction in soft stuff, and all-around off-road play action is well suited to the Diamond Spike.

than 40 tires for your truck

GUIDE

a section of the bead just enough to get a drop of glue in between the tire and rim, let the bead drop back into place, then move to the next section of bead. Repeat until you've completed one side of the tire, then move on to the next tire. By the time you've glued up one side of each tire, the tire you started with will be dry enough for you to flip it over and complete the job.

■ Rubber bands are your friends. As you complete gluing each tire side, wrap the tire with a broad rubber band (no. 64 RC airplane wing rubber bands are perfect). This will hold the tire tightly to prevent gaps between the tire and rim.

Follow the tips above, and you'll be rewarded with a tightly bonded rim. As a finishing touch, apply a drop of CA where the top of the rim's outer flange

meets the tire, and then slowly rotate the tire so the CA follows the seam. This will "seal" the tire to the rim so dirt doesn't pack into the tire-rim joint. Now you have a set of race- (or backyard-) ready tires that will stay together no matter how hard you jump or corner your truck.

2.2 TRUCK TIRE GUIDE

PRO-LINE

A fixture on the racing scene and the industry's most prolific tire innovator, Pro-Line has a tire for every type of racing surface, plus some street and just-fun treads for those of us who realize there's more to RC than racing! Most of the competition tires are offered in M2 (soft) and M3 (super soft) compounds and include foam inserts. The "sport" tires are offered in a harder compound (unnamed by Pro-Line; we'll call it "medium") designed for extended wear and good all-around traction.



MASHER

Compound: medium

Application notes: this great-looking chevron tread will give your rig monster-truck style. Note the tapered tread bars that give the tire a flat profile.

DIRT PAW

Compound: medium

Application notes: large square knobs deliver all the bite you need for heavy, soft dirt and backyard surfaces.

TRAC-TA-GATOR

Compound: medium

Application notes: this flat-carcass, he-man tire is great for the backyard and the woods, and it looks mean.

SPEED PAW

Compound: medium

Application notes: on thick, gummy soil, the widely spaced knobs might actually hook up well enough for competition, but this tire is best suited to play on a variety of backyard and vacant-lot-type surfaces.

SAND PAW

Compound: medium

Application notes: ya gotta love the paddles! As the name implies, this tire is the hot ticket for a sandy beach or desert setting.



DIRT HAWG II

Compound: M2

Application notes: this versatile tread takes on all types of hackin'-around terrain, and it will even tackle the street, thanks to its broad, flat-tread design.

GLADIATOR II

Compound: M2, M3

Application notes: the intricate tread pattern of the Gladiator works well in all types of soft, dry conditions. The tall, blocky tread and high, ribbed sidewalls provide extra bump absorption.

ROAD HAWG II

Compound: M2

Application notes: the hot-looking Road Hawg II is perfect for a scale look (especially if you like Goodyear Eagles) and can really tear it up on the street.

SPEED HAWG II

Compound: M2

Application notes: the Speed Hawg is very similar to full-size Bridgestone Potenza tires and an obvious choice for street action.

ROAD RAGE T

Compound: M2

Application notes: the distinctive look of the Pirelli P7000 is captured here, and the scaled-down tread is effective on all types of hard surfaces.

Take it to the rim

HPI

Sure, you could boil your old tires off the rims to free them up for new rubber, but do you really feel like cooking up a pot of tire soup just so you can recycle a battered wheel? Score some new rims to go with those fresh tires!



SUPER STAR UNIVERSAL

Available to fit: adapters included to fit just about any truck. Colors: chrome, black, white 26.9g



MESH MT

Available to fit: HPI Nitro Rush; also fits Associated, Losi (front only); HPI RS4 MT/Nitro MT. Color: chrome 29.9g

RPM



STARZ/TYPHOONZ

(Typhoon is similar with directional spokes) Available to fit: Associated, Losi Colors: satin aluminum, white (dyeable) 24.2g



TORKERZ

Available to fit: Associated, Losi Colors: satin aluminum, white (dyeable) 25.1g



CLAWZ

Available to fit: HPI RS4 MT, Traxxas, Associated and Losi Colors: chrome, white (dyeable) 23.2g



STRIKER II

Compound: M2
Application notes: this dirt-ovalish tire is a Pro-Line classic that works great on the street or on any hard surface.



BLADE

Compound: M2, M3
Application notes: the Blade represents the latest in Pro-Line front-tire-tech; it is meant to deliver good turn-in via the traditional ribs while providing good bite as the truck continues through the turn, thanks to the micro-block tread. The

Blade is best suited to blue-groove and clay tracks.



EDGE

Compound: M2, M3
Application notes: Pro-Line's popular Edge front tire works well on just about any surface. The design features beveled ribs that join in a V-shape that gives steering response a neutral feel.



SUPER SQUARE T

Compound: M2, M3
Application notes: although it appears very similar to the Stubble T, the Super Square's tread is slightly taller and has more center "bars" in the pattern. The square pins are also smaller and more closely

spaced. The Super Square should also work well on tracks that suit the Stubble, but it may have an advantage if there's a loose layer of silt over the groove. Experiment to see which works best.



STEP PIN T

Compound: M3
Application notes: this tire excels on softer, loamy tracks and is a good all-around racing tire.



STUBBLE T

Compound: M2, M3
Application notes: the Stubble T has a very shallow tread pattern designed for hard, blue-groove, clay tracks. The tread's center bars are designed to increase forward bite.



BOW TIE T

Compound: M2, M3
Application notes: the lugged Bow Tie tread excels on soft tracks and delivers plenty of forward bite but may not deliver the same cornering grip as Pro-Line's Step Pin. The long-lasting Bow Ties are a good choice for gas racing.



HOLE SHOT T

Compound: M2, M3
Application notes: the Hole Shot's square pins are more widely spaced and just slightly wider and taller than the Super Square's. This tire should perform best on tracks that are hard packed, if not quite blue-groove material.

Are spec tires in your future?



Although no one likes to lose, it's easy to overcome defeat when you know that the other guy simply out-drove you. Practice a little more, work on your setup, and take another shot next weekend. No biggie.

On the other hand, it's more difficult to get over a loss when you feel you were simply outspent. When the

winner bought a \$100 matched pack for the Main and eight sets of tires over the course of the day to find the hottest shoes for his truck, it's hard not to be bitter when you know that you beat him in both qualifiers. Team Losi knows how that stings and developed the dirt-spec concept to combat wallet racing at club tracks. The idea is built around spec motors and batteries in a spec truck (a Double-Xt 'CR'), but the most eye-catching and innovative aspect of the program is the dirt spec tire.

In case you haven't noticed (or you're colorblind), the Dirt Spec tires are bluer than Papa Smurf. The tread patterns are proven performers (directional rib fronts, step-pin rears), and according to Team Losi, the specially formulated blue compound is designed for extended wear. More impor-

tant, the tires are easy to tech; if they're blue, they're legal!



Pro-Line



SLINGSHOT

Available to fit: HPI RS4 MT, Traxxas, Associated and Losi
Colors: chrome, white (dyeable)
32.7g



TALONZ

Available to fit: HPI RS4 MT, Traxxas, Associated and Losi
Colors: chrome, white (dyeable)
21.2g



AGITATOR

Available to fit: Traxxas
Colors: chrome, white
24.4g



VELOCITY

Available to fit: Associated, Losi
Colors: neon yellow, white
21.3g

2.2 TRUCK TIRE GUIDE

Team Losi

Team Losi is another needs-no-introduction company; the team has won world championships, and Losi cars and trucks are some of the best in RC. But even before the first Losi vehicles ever saw dirt, the name was well-known for high-quality racing rubber. Team Losi

tires dominated the ROAR nats circuit last year and the company has always been about hard-core competition. Even Losi's street tire is offered in two compounds: silver (soft) and red (softest).



DIRECTIONAL RIB

Compound: red, silver

Application notes: Three beveled ribs and two "regular" ribs give this tire its "directional" design. The tire can be mounted with the beveled ribs on the inboard half of the wheel for maximum steering response, or with the beveled ribs outboard for less aggressive steering.



8-RIB

Compound: red, silver

Application notes: the low-profile ribs of the 8-rib design flex less for consistent steering response at both high and low cornering speeds. The number of "steering edges" that contact the track increases with steering input for a linear feel.



REPTILE

Compound: red, silver

Application notes: Losi's aggressively treaded Reptile is best suited to softer tracks. The wide center bars deliver plenty of forward bite, and the widely spaced knobs are less likely to clog in the sticky stuff.



TAPER-PIN

Compound: red, silver

Application notes: this popular tire tames dusty and blue-groove tracks. Low-profile pin knobs and center bars give your truck extra grip on hard clay and similar surfaces.



STEP-PIN

Compound: red, silver

Application notes: the Step-Pin offers a versatile tread pattern that hooks up well on just about any track with a "real" off-road surface that includes soft soil and bumps; a great tire for many club tracks.



IFMAR PIN

Compound: red, silver

Application notes: lots of well-spaced mini-pins cover this tire and even cross into the sidewall area for good side bite and reliable performance on slightly loose or dusty tracks.



IFMAR STUD

Compound: red, silver

Application notes: when the going gets soft, this is the tire to reach for. Thick, no-nonsense knobs move plenty of dirt to get your truck off the line and out of turns in a hurry. You can cut down the knobs to accommodate tracks with varying conditions.



T-2000

Compound: red, silver

Application notes: if your track is hard and dusty but not quite hard enough to groove up, try the T-2000. The T-shape center lugs help with forward and side bite.



LST T-90 STREET

Compound: red, silver

Application notes: Losi's street-truck treads are offered in two compounds to allow you to easily dial in traction on all pavement and concrete surfaces, and they look killer.

About Inserts

None of the true racing tires in this guide come close to delivering their performance potential unless they are installed with foam inserts. No big deal; they all include the inserts you need. However, the stock foams aren't your only option. Both Trinity and Pro-Line offer foam inserts of various hardnesses and even multilayer inserts for the ultimate in traction control. Here are the basics of foam tuning:

- Use harder inserts on harder tracks. The better the traction, the firmer you can go. You should find that your truck carries more speed through the turns with the firmer inserts.
- To maintain the softness of the tire's tread area



while bolstering sidewall stiffness, try a multi-stage foam insert with a firm "bottom" layer.

- Trim the outer edges of the foam insert to help produce a rounded tread profile; if you leave the inserts "as is," they tend to flatten the tread (which can be good for hard, high-traction surfaces). You can also

trim the inside edge of the foam where it meets the bead of the tire for a better tire/rim fit.

- If you choose to use multi-stage foams, be sure to glue the "stages" together; Trinity offers Team Kinwald Multi-Stage Tire Glue just for this purpose and claims it offers the proper flex characteristics to avoid creating a hard seam between stages.

TRINITY TEAM KINWALD

- Single Stage Ultra Firm (use with slicks)—part no. TK1522.
- Soft Dual Stage—TK1514.
- Firm Dual Stage—TK1519.
- Triple Stage—TK1516.

PRO-LINE

- 2-Stage—6194.
- Single Stage Firm—6192.
- Single Stage Ultra Firm—6196.

TTR

Thunder Tiger Racing (TTR) is new to the tire world, but it has plenty of experience making vehicles that can burn up a set of tires in a hurry, most notably the red-hot EB-4 1/8-scale buggy tested elsewhere in this issue.

TTR's Challenge tires are offered in five (!) compounds, with softness indicated by letter: "A" is the softest; "E" is the firmest. All include strip-type inserts that are preshaped to match the tire and rim profile.



DOG BONE TREAD

Compound: A-E

Application notes: widely spaced, dogbone-shape lugs help this tire cope with soft surfaces that might clog finer tread patterns. Note that the side lugs are turned for maximum side-bite, while the main tread area's lugs are perpendicular to the center seam for maximum forward traction.



LADDER BLOCK

Compound: A-E

Application notes: wide center bars give the Ladder Block good forward bite, and edgy square knobs help your truck dig in on hard tracks. The tread pattern is a bit tall for blue-groove tracks.



BEVEL RIB

Compound: A-E

Application notes: TTR's front tire is similar to Pro-Line's Edge design and features beveled ribs that join in a "V" to better penetrate loose soil.

CLICK HERE

DuraTrax
www.duratrax.com

HPI
www.hpiracing.com

Pro-Line
www.pro-lineracing.com

RPM
www.rpmrcproducts.com

Team Losi
www.teamlosi.com

TTR
www.skyhobby.com

Tire Finder

Name	Compound(s)	Application *	Foam insert	Part no.	Price **
DURATRAX					
Step Spike	Hard	BY	-	DTXC8115	\$12.99
Offset Spike	Hard	BY	-	DTXC8111	\$12.99
Slant Spike	Hard	BY	-	DTXC8110	\$12.99
Street Trac	Hard/soft	S	-	DTXC8005/8106	\$12.99
Hard Slick	Hard	S	-	DTXC8130	\$12.99
Lo-Pro Racing Pin Spike	Hard	BY, L	-	DTXC8116	\$12.99
Split V-Spike	Hard	BY	-	DTXC8113	\$12.99
Front Rib	Hard	F: BY	-	DTXC8000	\$12.99
Diamond Spike	Hard	BY	-	DTXC8114	\$12.99
PRO-LINE					
Masher	Medium	BY	-	1041	\$14.50
Dirt Paw	Medium	BY	-	1043	\$14.50
Trac-Ta-Gator	Medium	BY	-	1045	\$14.50
Speed Paw	Medium	BY/L	-	1047	\$14.50
Sand Paw	Medium	D	-	1052	\$14.50
Dirt Hawg II	M2	BY/S/L	■	1070	\$17.95
Gladiator II	M2, M3	BY/L	■	8170M2/M3	\$17.95
Road Hawg II	M2	S	■	1060	\$17.95
Speed Hawg II	M2	S	■	1080	\$17.95
Road Rage T	M2	S	■	1062	\$17.95
Striker II	M2	S	■	1050	\$14.50
Stubble T	M2, M3	BG	■	8190M2/M3	\$17.95
Step Pin T	M3	H, L	■	8097M3	\$17.95
Blade	M2, M3	F: BG	■	8195M2/M3	\$17.95
Edge	M2, M3	F: H, L	■	8095M2/M3	\$17.95
Super Square T	M2, M3	BG, H	■	8199M2/M3	\$17.95
Bow Tie T	M2, M3	H, L	■	8196M2/M3	\$17.95
Hole Shot T	M2, M3	H, BG	■	8192M2/M3	\$17.95
TEAM LOSI					
Directional Rib	Red, silver	F: H, L	■	A-7505R/S	\$17.95
8-Rib	Red, silver	F: BG	■	A-7507R/S	\$17.95
Reptile	Red, silver	H, L	■	A-7633R/S	\$17.95
Taper Pin	Red, silver	BG	■	A-7635R/S	\$17.95
Step Pin	Red, silver	H, L	■	A-7636R/S	\$17.95
IFMAR Pin	Red, silver	BG, H	■	A-7638R/S	\$17.95
IFMAR Stud	Red, silver	H, L	■	A-7639R/S	\$17.95
T-2000	Red, silver	H	■	A-7641R/S	\$17.95
LST T-90	Red, silver	S	■	A-7690R/S	\$17.95
TTR					
Dogbone	A-E	L, H	■	***	***
Ladder Block	A-E	H, B	■	***	***
Bevel Rib	A-E	F: L, H	■	***	***

Application Key: F=front tire; S=street, concrete, asphalt; L=loose "fluffy" dirt; H=hardpack dirt/clay;

BG=blue groove, extremely hard tracks; D=dunes, sandy conditions; BY=backyard, grass, woods, all-around off-road play.

*Application notes are offered as a reference point; experiment to see what works best on your track.

**Price varies with location

***Prices and part numbers not determined at press time

The addresses of the companies featured in this guide are listed alphabetically in the Index of Manufacturers on page 208. ■

Billy Easton wins ISTC World Cup '99 in London

After 13 rounds of exciting racing at the British Racing Car Association's (BRCA) International Scale Touring Car (ISTC) World Cup held at Alexandria Palace in London, Team Associated's Billy Easton emerged victorious with his TC3 sedan. Easton was one of five drivers to finish with a maximum score, but his super-fast, 8-second-total-elapsed time advantage over HPI driver Jean-Marc Betticher (second place) clinched the championship. After barely edging out Barry Baker (Yokomo) and Craig Drescher (Associated), Mark Pavidis, also racing a TC3, secured third. Reedy motors and batteries powered Easton's car, and an LRP V7.1 ESC and Phaser receiver controlled the power and the radio signals.



HPI expands its 2000 racing schedule and product line

Because of the great success of the '99 HPI Challenge race in the U.S., HPI plans to run six or eight different races this year throughout the country with a grand finale in Southern California, which will be held in a highly visible, fun location. HPI tentatively plans to hold races in Florida, Texas, Ohio, Nevada, Wisconsin, New Jersey and California; however, confirmation of this information was not available at press time. HPI Europe and Japan also run many Challenge races throughout the year, and it's rumored that the champions of those events will be flown to California to compete against the U.S. champions at the finals in California. Check HPI's website (www.hpiracing.com) for more details.

Nitro and electric racers will soon be in for a treat because HPI has announced plans to release two very important new kits in early spring 2000. The new Nitro RS4 Racer 2 kit is an all-out competition vehicle that will include many of the company's cool hop-ups in lieu of a body and an engine. Obviously, the kit will be based on the new Nitro RS4 2 chassis, but don't be surprised if HPI includes certain key features that are not available in any other HPI car kit. HPI also plans to release an electric sport sedan based on the Pro 2 chassis; this kit will come complete with a Lexan body and a price that will surely attract many newcomers to the hobby. We'll keep you posted on further developments.

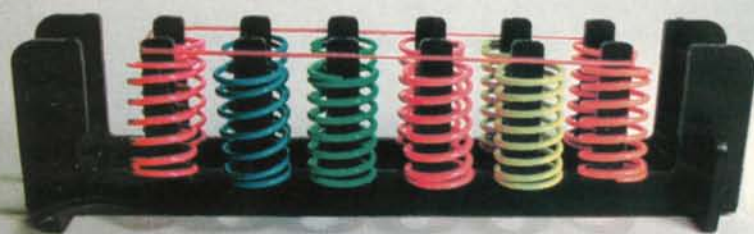
New Control Tire from Pro-Line

Pro-Line's new H13-compound tires reportedly offer tremendous grip, yet they can last through an entire weekend of hard racing, and this makes them an excellent choice for touring-car racers of all skill levels. To exploit this new compound, Pro-Line has designed a special, 24mm-wide control tire (spec tire) molded from the new "wonder" compound that will be used at racing events, where tire expense is an issue. The new tires will have the words "Control Tire" molded on one sidewall and a letter or symbol molded on the other, which can be changed to designate the race or series. This will make policing the tires very easy, and racers will love it, too, because their tire expenses will be significantly reduced.

The Florida State Electric Auto Racing Association (FSEARA), which runs an eight-race point series every year, has used the new Pro-Line control tires and reports that its participants love the control-tire concept. The next Reedy International Touring Car Race of Champions will use Pro-Line Control Tires in all classes except the Invitational, and the tires will be available for other races and series as well. If you're a track owner or a race organizer who would like more information on these new tires, give Pro-Line a call.

RACER TIP OF THE MONTH

George M. Gonzalez Senior West Coast Editor



A battery-building jig is an absolute necessity for building batteries, but it's hardly ever used for anything else; it just sits in a drawer until the next time you buy a new battery pack. Here's a tip, though: use the jig to organize and store your touring-car shock springs, as shown in the photo. Six pairs of tuned springs can be stored on the jig; a rubber band will hold them in place during transportation. Use a hobby knife to make small notches on the four outer ears of the jig so the rubber band stays in place, and you'll be all set.



RACER news

INNOVATOR AT WORK

Akira Kogawa

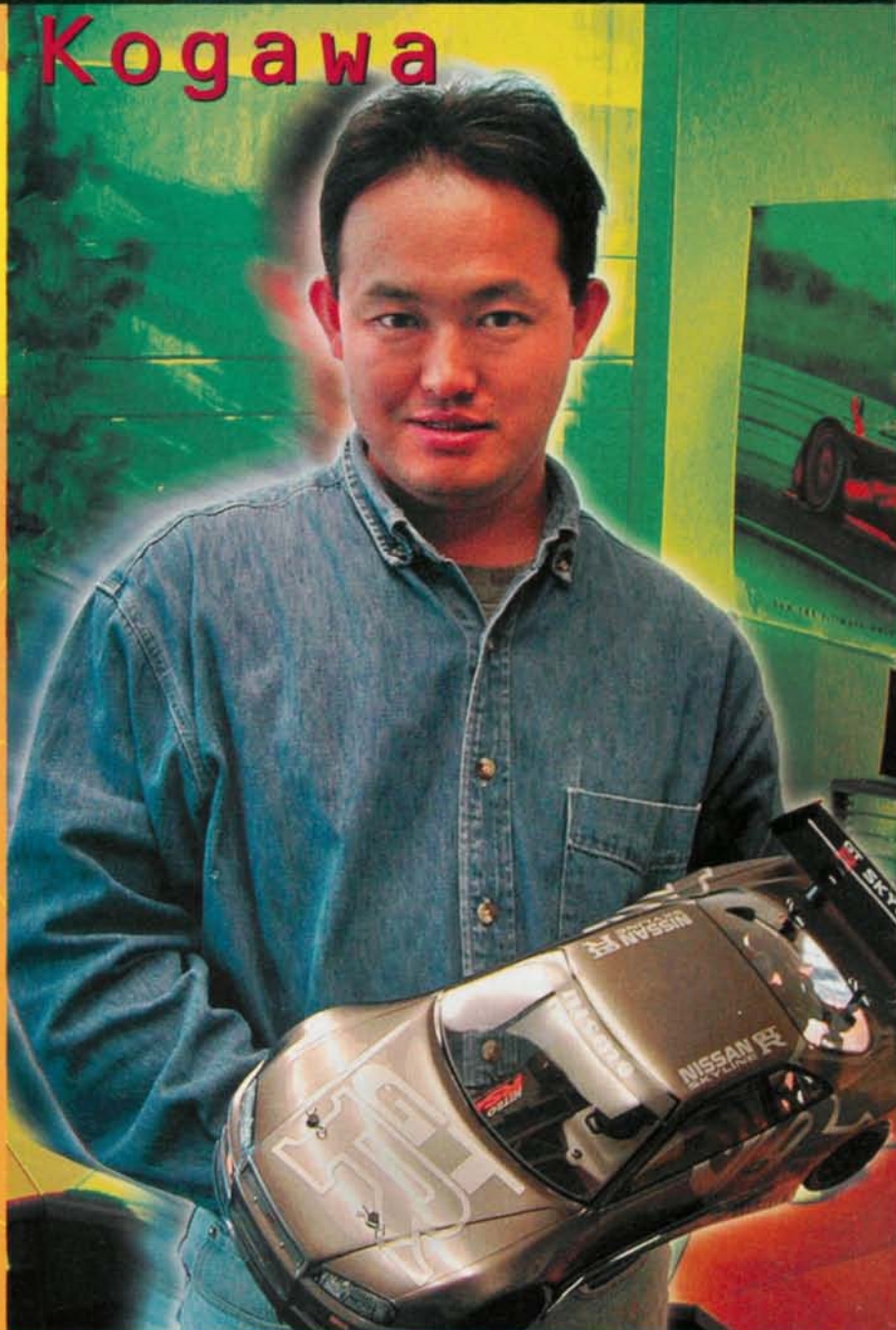
Hobby Products International (HPI) has come a long way in just a few short years. It is one of the most innovative and fastest-growing companies in the RC industry. Much of its success has been attributed to the talented employees of HPI in its U.S., Japanese and European facilities. This month, we talk to HPI's lead engineer, Akira Kogawa; I'm sure you'll find his background both interesting and inspiring.

Radio Control Car Action: Akira, you have an interesting RC background that few of our readers are aware of. Would you fill us in on it and also talk about some of the products you've designed?

Akira Kogawa: I attended Machine Science High School and made RC parts on the school machines every day. I made differentials for $\frac{1}{8}$ -scale vehicles and accessories such as flywheels. As a high-school student, I raced a lot of $\frac{1}{8}$ -scale cars with Katunori Kondo, who won a McCoy $\frac{1}{8}$ -scale race in the early Eighties and came in second at the 1987 IFMAR Off-Road Worlds in both two- and four-wheel drive.

After I graduated from high school, I went to work for Auto Model, a company that designs RC cars for Kyosho. In 1983, I designed my first RC car kit: the Blizzard EP, which is the electric version of the new Nitro Blizzard that Kyosho released last year. Then I designed the $\frac{1}{12}$ -scale EP Phantom, which was a chain-drive, four-wheel-drive car. The Phantom won the Japanese Nationals a couple of years in a row. After that came the $\frac{1}{12}$ -scale EP Plasma, the Scorpion series, the Tomahawk and the Optima four-wheel-drive series. I also designed the Ultima two-wheel-drive series, which won the IFMAR Off-Road World Championships in 1987 with Joel Johnson driving. Then came the Optima Mid series of cars, the front-wheel-drive Magnum and the $\frac{1}{8}$ -scale Kyosho Burns.

RCCA: Wow, that's quite a list! I own a Kyosho Blizzard EP, and it's an honor to know the designer personally. Tell me how you got hooked up with HPI.



AK: I had known HPI owner Tatsuro Watanabe for about fifteen years, and every year, Kent Clausen and I would meet at the Worlds. I first met Kent in Denmark at the '84 Worlds. Sometimes, Tatsuro would

meet up with us at the IFMAR races, and in 1987, he brought his Uno line of motors and Masami Hirotsuka to England, where he won his first world championship with Tatsuro's motor. That was the same year





1985: Akira and Kent Clausen at the Ranch Pit Stop for the IFMAR Off-Road Worlds.

Joel Johnson won with the Ultima, and five Optima Mids made the A-main, including Masami. I moved to the U.S. in 1989 to work with Kent and Mike Lavacot at their company, Lavco.

Kent was not only my coworker, but he was also my English teacher. One day, he told me to ask the UPS driver, "How would you like a punch in the face?" and, with no idea what the words meant, I did! The UPS guy laughed it off, fortunately, but every day I learned something new from Kent. Then, in 1990, Tatsuro needed a lead engineer for his company, and he asked me to join his team. The first product I designed was the Super Star wheel, which is still in production. Then we started making aftermarket parts like wing buttons, pan-car wheels and parts for Associated on-road vehicles.

RCCA: What is the most rewarding part of your job?

AK: I really like the body-manufacturing process. We had no experience when we started and had to learn everything from scratch. I prefer the fashion and performance characteristics of an RC car body, while other companies concentrate more on scale looks. Making our own bodies allows us to design them the way we want, and we like bodies that look good, perform well and have nice decals.

RCCA: What are some of your fondest RC memories?

AK: My happiest RC memory was in 1988,

when the Kyosho Burns took the TQ and came in second overall by just a few feet in a one-hour race! It was a very fun race—about a hundred and thirty laps, five pit stops and the top three cars all on the same lap. It was really close, but it was fun to watch and participate. Another unforgettable memory is Joel Johnson winning the Worlds in '87 with the Kyosho Ultima. I was one of his mechanics for that race, and we celebrated quite a bit afterwards!

RCCA: Of all the cars that HPI manufactures, which do you like the most and why?

AK: It would be hard to say for sure because I enjoy all the HPI vehicles. But the RS4 MT and Super Nitro RS4 would probably be my top choices. Both are really fun to run, and they also look really good. My philosophy has always been that for it to be a good kit, it must look good and offer excellent performance. I really like the Super Nitro's quick-release upper deck; I was involved with 1/8-scale on-road racing for a long time, and it was always a big deal to clean the car, so that feature really appeals to me! Drifting the MT around on a flat dirt track with the big tires is really fun and controllable, and that's what I like most about the RS4 MT. I also like the Rally, Proceed and many of the other kits.

RCCA: The ready to run [RTR] segment of our hobby is soaring, but you already know that because of the Nitro RS4 RTR's success. Does HPI plan to release any more RTR vehicles in the near future?

AK: More and more, newcomers want kits that are ready to go right out of the box, so we are definitely planning to release more RTR kits in the future. We'll be offering both unassembled kits and RTR versions of our Nitro Rush two-wheel-drive stadium truck, and the Nitro MT four-wheel-drive truck will also be available as a kit or RTR. The RTR trucks will come with the new OEM Airtronics radio systems that have a better overall design than the Rival series and are designed with American racers in mind. We're happy with the success of the RTR Nitro RS4 and think that the RTR kits we'll release in the future will be just as successful!

RCCA: How do you unwind from work? Are you involved in any other hobbies?

AK: My real cars take up a lot of time when I'm not working at HPI; I maintain all the cars in my family. I also spend as much time

as I can at home with my wife and daughters. I like to attend full-size car shows, both locally and in Japan, to see what the full-size car manufacturers are up to. Then there's watching real car racing—another favorite pastime.

RCCA: I'm sure that many of your friends and colleagues in the hobby often tell you that you have the greatest job in the world: a career that revolves around a hobby that you're deeply passionate about. Most don't realize, however, the amount of specialized training and hard work that was involved in getting where you are today. Do you have any advice for those who have a talent for tinkering or aspire to someday become an RC engineer like you?

AK: Imagination and creativity are large factors, but you also need to have a passion for the design process. It's easier to start when



Akira was still in high school when this shot was taken; in addition to his studies, Akira was working for Kyosho.

you're younger, so if you're young, keep trying; keep at it. Knock on some doors where you want to work. I got my engineering inspiration from my father. He built an entire TV by himself; he was inclined to do things like that, since he was an electrician in Japan.

I spent a lot of my spare time building model cars and disassembling stereos. I keep trying to get closer to the perfect design; I never stop trying to improve.

RCCA: Thanks for your time, Akira. I hope to see you soon.



RACER news

Speed Shop

Acer Racing Ultrasonic Ball Bearings

The people who run Acer Racing* are dedicated to manufacturing products that help reduce driveline friction and rotating mass while reducing routine vehicle maintenance. In keeping with the aforementioned criteria, Acer has just released its new line of Ultrasonic Super Precision Ball Bearings. These new bearings are strong, lightweight and smooth, and for the best protection against abrasion and wear, they feature dual rubber seals.



American standard and metric bearings are available in flanged and non-flanged models. The bearings can be ordered separately or in complete kits for HPI, Associated, Traxxas, Yokomo, Team Losi, Kawada and many others.

According to Acer, its new ABEC-5 series, dual super-metal-shielded bearings are the highest grade of high-speed bearings recommended for electric motor applications, and they feature precise tolerances for extra-low mechanical and audible noise levels. Acer also claims that its efficiency is on a par with the bearings supplied with most motors. If you're looking for that extra competitive edge, check out Acer's new bearings; while you're at it, try out the company's "Diff Rocks" carbide and ceramic diff balls; you'll be happy you did.

Dual super rubber sealed ball bearings—for pricing and part numbers, call Acer Racing or log on to www.acerracing.com.

ABEC-5 dual super-shielded electric-motor bearings—ELECTRM; \$10.99/pair.



HPI Linear Tuned Springs for RS4 series vehicles

HPI's* new Pro Linear Springs are designed for electric RS4 Pro 2 racers, but they work equally well with the company's nitro lineup of RS4 sedans. The new shock springs feature consistent (linear) spring action throughout the entire range of suspension travel, just like the shocks used on real racing cars. These new springs are not intended to replace HPI's existing line of "progressive rate" tuned springs; instead, they're designed to broaden the tuner's range of choices.

The Pro Linear Springs are available in six rates and are all 13x29mm long. The springs are made of high-quality alloys, and the spring ends are ground flat to ensure equal length. The springs are also powder-coated in bright colors for easy identification in your parts box. In spring rate, the new springs fall between the existing Gold and Yellow springs, and for precise track tuning, the rate increments between each spring are very small.

Pro Linear Springs—6841 (Orange 216g/mm), 6843 (Yellow 227g/mm), 6844 (Red 238g/mm), 6846 (Green 247g/mm), 6847 (Blue 264g/mm), 6849 (Pink 272g/mm); \$5.50.

KO Propo Battery Checker

If you're as into nitro racing as I am, you're going to love KO Propo's* new, onboard Battery Checker. The Battery Checker is a small, lightweight battery meter that you install on your vehicle's chassis to monitor the voltage level of the onboard receiver battery pack. The Battery Checker features seven LEDs (in three colors) that are brightly lit so the meter can be viewed from a distance. As the voltage drops in the battery pack, the LEDs turn off one by one, and this makes monitoring your battery pack's condition a foolproof task. Installing a Battery Checker in your vehicle will actually make the onboard battery pack last longer because it won't be charged unnecessarily, which can cause cell memory problems. Both 4.8V (4-cell) and 6V (5-cell) models are available, and the unit is designed for rechargeable Ni-Cd and NiMH battery packs only.

Battery Checker (4.8/6V)—part nos. 73301/73302.





RACER news



The fifth annual Tamiya Championship Series (TCS) nationals was held at the Tamiya America facility in beautiful Aliso Viejo, CA. Throughout the year, regional races are held at various sites in the U.S., culminating in California. Competitors from all over the U.S. and Canada came to California to compete in four classes for a chance to travel to Japan for the TCS World Championships. All classes must follow strict rules, which makes for very evenly matched competitions. Only Tamiya cars, parts and hop-up options are allowed, and this resulted in some great, close racing.

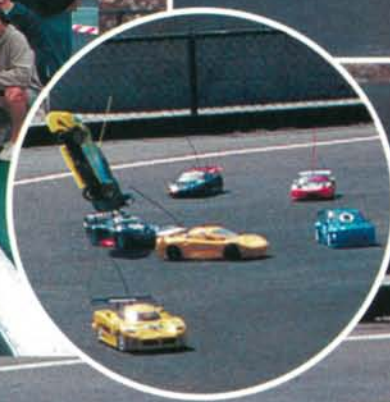


TAMIYA TCS nationals

by Kevin Hetmanski

QUALIFYING

Six rounds of qualifying and a point system determine the winner in each class—not the standard rounds of qualifying and Mains. The two slowest heats are thrown out, so one poor performance won't hurt you. Whoever has the most points at the end of the weekend is the winner. Three rounds of qualifying were run on Saturday and Sunday. Saturday morning was a tough one for all the racers; the weather wasn't what you would call perfect. Cold temperatures and drizzle made the track a skating rink. Tire warmers were definitely the hot setup. After a couple of laps on the track, the tires were collecting a gooey substance that made it even more difficult to move the cars around the track. After round 1, a 45-minute lunch break was declared. The drizzle slowed down, and in round 2, track condi-



The concours winners from each class. Drivers were required to run their winning bodies in at least one race. These guys went to town on detailing; I certainly wouldn't want to run my car if it looked that good!

tions improved dramatically. Racers picked up as many as three laps. As the day went on, conditions gradually improved, and on Sunday, the weather was beautiful. The track was perfect, and the racing reflected that.

F1

The F1 cars were the coolest to watch. A lot of them were painted just like real F1 racecars. Their simplicity and the fact that they must race with kit-type, closed endbells make this class fun and affordable. This year, it was decided to allow racers to use rubber tires instead of foam, as stated in the rule book. Only certain compounds are allowed in the series, and it wasn't an easy task to tech the tires. The rubber tires were the best solution to the problem of teching; they offer better control. Although this class is very





Going to Japan, baby! These guys are being flown to Japan by Tamiya to represent the U.S. in the TCS Worlds.

cool, Tamiya won't be running it in the TCS series next year. Maybe the good turnout for F1 at the Nationals will change Tamiya's mind, though. After a long weekend of racing, Russell Johnson took first place.

SUPER TOURING GT1

These were the fast guys of the weekend. Tamiya TA- and TL-series cars are legal for this class. These cars are allowed to use ball-bearing modified motors, and the car can be lightened. Tamiya rubber tires must be run; no traction compound is allowed. Wen-Ping Chiang

showed everyone in



Driving great David Jun was on hand to help tech all the cars and advise the racers.

this class who was boss; he went home with the win.

TOURING GT2

Just as in Super Touring GT1, Tamiya TA- and TL-series cars are used, but they are slightly limited. Only 24-degree stock or kit-type motors, rubber tires and tub chassis are allowed. Tamiya hop-ups are permitted, but lightening isn't. Everyone in this class was so evenly matched that



Lookit! People of all ages had a good time at the event.



There's always plenty of pit space and California sunshine at Tamiya's Aliso Viejo facility.

they really had to fight hard to win. After the dust had settled, Hank Shie ended up with the ticket to Japan.

"M" CHASSIS

This class is limited to the "M" chassis line. Only a stock, unmodified, kit-type motor or Johnson silver can be used. The cars can be set up with either front- or rear-wheel drive. These little cars made the track look huge. Raymond Flores was definitely The Man in this class; his smooth, consistent driving got him the overall win.



Tamiya had this tent set up to display and sell a lot of its products. This was great for the racers who needed last minute parts.

CONCLUSION

The TCS Nationals were a huge success. Everyone was very nice; I saw many people helping one another, and they even applauded the outcome of every race! That's what racing should be all about. Tamiya has such a great program going; if a TCS event is ever held nearby, I recommend that you check it out.



A "make-it-and-take-it" table was one of the attractions. Kids were given mini 4WD racers to build and race on a track set up next to the table. Some of Tamiya's staff was on hand to provide assistance to the kids.

RC DEMOS

In between rounds, Tamiya put on some neat demonstrations. The new Wild Willy 2s were demo'd, and they were so cool to watch; the crowd got a huge kick out of those little Jeeps pulling wheelies all over the place. On Sunday, I had a chance to drive one myself in the Media Madness race. I didn't do all that well in the race, but I had a great time tooling around with those little monsters. In another demo, Dave Jun and two other Tamiya factory drivers raced around the track with the new 414X, and everyone got a chance to see what the car is capable of on a racetrack. These cars were fast, and they looked impressive. When the racing was over, Tamiya gave all the winners identically prepared TLO1 cars, which they then raced in the "king of the hill" event. There were no rules, and that made it even more fun to watch. The winner was crowned "the best of the best!"

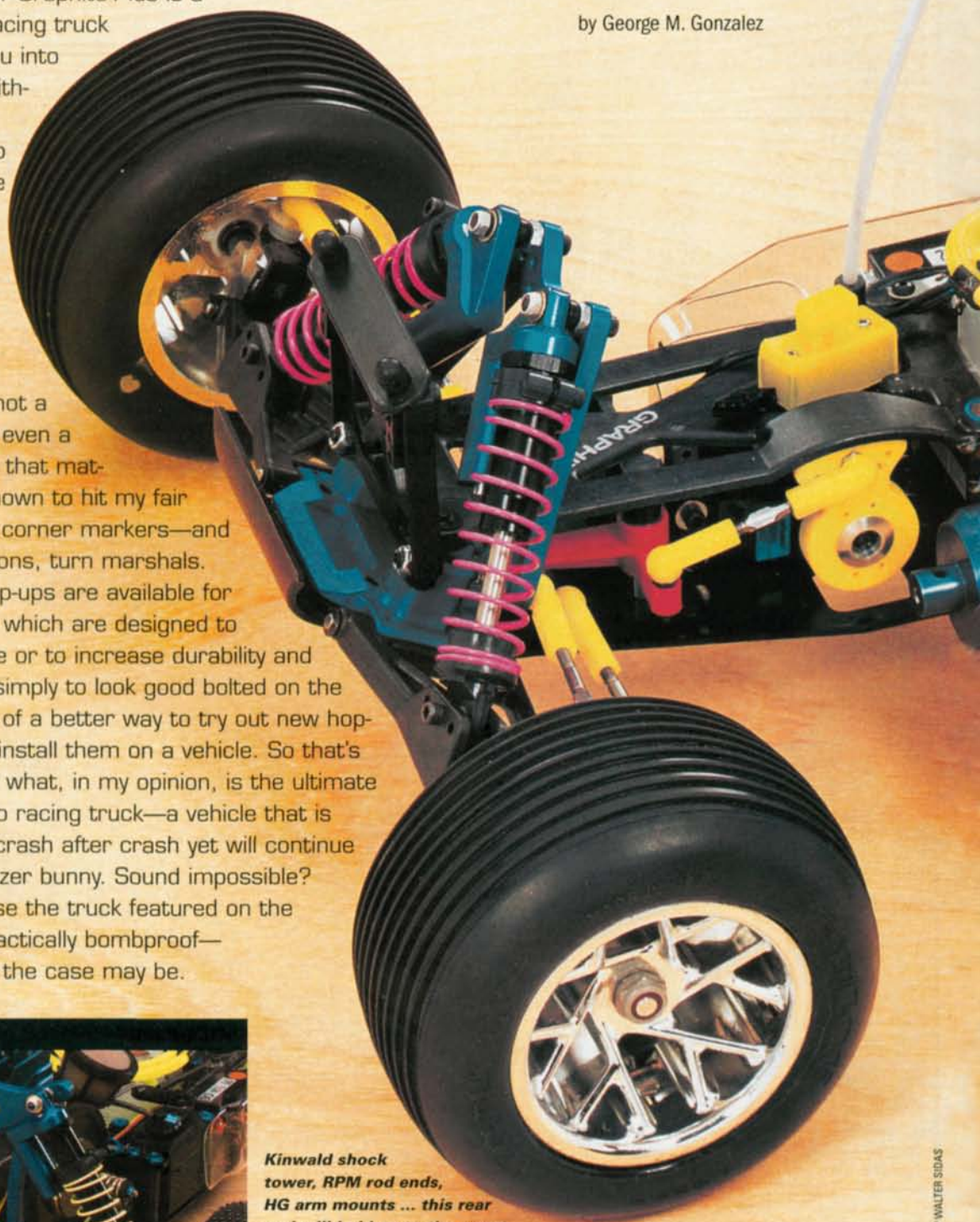
*Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■

PROJECT

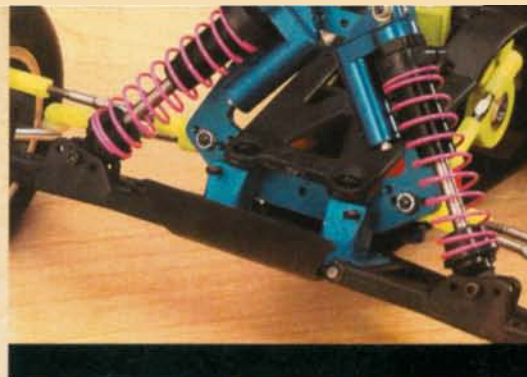
TEAM LOSI NXT FULLY LOADED LOSI

by George M. Gonzalez

Team Losi's* NXT Graphite-Plus is a thoroughbred racing truck that can take you into the winners' circle without your having to install a single hop-up on the chassis. Since the truck is a contender right out of the box, you're probably wondering why I chose the NXT for this project report. Here's the deal: I'm not a champion driver—or even a club-level master, for that matter—and I've been known to hit my fair share of boards and corner markers—and even, on rare occasions, turn marshals. Additionally, many hop-ups are available for this vehicle, some of which are designed to improve performance or to increase durability and some, quite frankly, simply to look good bolted on the chassis. I can't think of a better way to try out new hop-up products than to install them on a vehicle. So that's why I set out to build what, in my opinion, is the ultimate supercross-style nitro racing truck—a vehicle that is capable of surviving crash after crash yet will continue to run like the Energizer bunny. Sound impossible? Well, read on because the truck featured on the following pages is practically bombproof—or "G-Man-proof," as the case may be.



Kinwald shock tower, RPM rod ends, HG arm mounts ... this rear end will hold up to the worst abuse. I should have used blue-colored zip-ties.



Progressive Suspension's EDC shocks are burly-looking, but there's more to these dampers than good looks; the external reservoirs absorb the oil displaced by the massive shock shafts. The shafts are a key component of the shocks' external damping adjustment system.



PERFORMANCE UPGRADES

TEAM KINWALD

■ **FRONT BULKHEAD:** this part receives an enormous amount of abuse, so I replaced the stock front bulkhead with an absolutely bullet-proof Team Kinwald machined-aluminum front bulkhead. A more affordable remedy to help support the stock molded bulkhead is to install a Team Kinwald front hinge-pin brace. Part no. TK3069.

■ **AXLE CARRIERS:** Team Kinwald offers machined-aluminum rear hub carriers in 1- and 1.5-degree versions. I chose the 1.5-degree hub carriers, and the installation went without a hitch, thanks to their extremely close tolerances. The hub carriers are stronger than the stock molded pieces, and they will maintain superior bearing alignment even after years of use.

■ **SHOCK TOWERS:** the stock fiberglass shock towers are plenty strong, but they're not indestructible, so I replaced them with a pair of Team Kinwald machined-aluminum units. Now I can sky big jumps with complete confidence. The front and rear shock towers look great because of their blue-anodized finish; they feature all of the factory-shock- and control-rod-mounting locations that you expect.

HAMMAD GHUMAN

■ **PIVOT SUPPORTS:** I replaced the stock, molded rear pivot supports with HG's hot, new, machined-aluminum pivot supports, which offer two toe-in options (2 or 4 degrees)—depending on how they're installed on the chassis. In my opinion, the HG pivot supports are a "must-have" item, not only because they are indestructible, but also because they facilitate engine installation and make it easier to change spur gears.

■ **KNUCKLE ARMS:** HG's new GTX/NXT front knuckle arms (steering blocks) were installed. I received nonproduction prototype units from HG, and because of the time restrictions imposed by this article, they were the ones I tested. I found that the steering knuckles rubbed against the wheels, so I had to install axle shims to remedy the problem. I was not thrilled to install three shims on the left axle and four shims on the right axle. This indicated that the steering knuckles were slightly off, but that wasn't all: the car now had a slight case of "bump-steer." This was the first time I've ever experienced a problem with a hop-up part offered by HG; I feel confident they will fix this problem before GTX/NXT steering knuckles go into production.

■ **BALL JOINTS:** all of the stock steel ball joints were replaced with HG titanium ball joints in both long and short sizes.

PROGRESSIVE SUSPENSION

■ **SHOCKS:** the final suspension modification was a complete set of Progressive Suspension* EDC-2 Piggyback Reservoir shocks. These are the smoothest shocks I've ever installed; they continue to operate smoothly even after weeks of constant pounding. You can adjust damping externally without even removing the shocks from the vehicle. They're also the only shocks that will operate at any angle without developing air pockets that affect performance—truly awesome! The EDC-2 shocks are, however, time-consuming to assemble, but the building time is easily compensated for since they don't need rebuilding as often as stock shocks do.

ENGINE UPGRADES

I added a few engine accessories to make the small block perform at its best. I installed a Team Kinwald Kool Power Punk Hyper Head to keep engine temperature in check. I love the low-profile, vertical-fin design and appreciate the fact that it won't "overcool" the engine.

An MIP* Boost Bottle was added to smooth out bottom-end power transfer and to help the little engine idle more smoothly. I installed an MIP onboard temp gauge to let me keep an eye on engine temperatures. The gauge is installed onto the back of the steering servo with double-sided tape, so the LCD is viewed through the Lexan receiver cover. I had to relocate the on/off switch to mount the temp gauge where I wanted it. I also installed an MIP 2-N-1 clutch, which is adjustable, extremely smooth and long-lasting.

The NXT's stock tuned pipe works extremely well and is highly recommended for ROAR-sanctioned racing, but I replaced it with a CVEC tuned pipe. This pipe is not ROAR-legal, but I'm not concerned since I race mostly at the club level. The Innovative Technologies* CVEC pipe is smooth and adjustable, and you must admit: the dual-exhaust tips are cool.



Check out the Team Kinwald Kool Power Punk Hyper Head, Associated blue exhaust header, CVEC tuned pipe, Motor Savers air filter and GS Racing silicone fuel line, switch cover and nylon servo-saver.



I installed the MIP temp gauge behind the Lexan protective cover next to the Hitec DCX receiver where the on/off switch normally goes. The switch was relocated on top of the steering servo where it can be accessed easily.

RACING ELECTRONICS

I wasn't about to skimp when it came to choosing electronics for my Project NXT. I selected my favorite steering and throttle/brake servo combination, which happens to be an Airtronics* 94157 high speed/high torque steering servo and 94737 high-speed throttle and brake servo. I enlisted the help of my Hitec* Lynx 3D radio and used its dedicated DCX receiver. A Team Orion* 1000mAh NiMH 6V battery pack powers the radio system and provides enough run time to last through a 60-minute endurance race.

EYE CANDY

The Team Kinwald* and Hammad Ghuman (HG)* machined-aluminum components are designed to increase the vehicle's strength, and they also look really good mounted on the chassis. I decided to add a few glamour parts to ensure that my truck stands out in a crowd. General Silicones (GS Racing)* manufactures the highest quality silicone products available. The company's RC division represents only a small part of its business because it manufactures products for large companies such as General Electric, Toshiba, Motorola, Bosch and Delco.

I used GS Racing's silicone fuel line, J-type exhaust coupler, switch cover and awesome, new, heavy-duty nylon servo-saver; all come in the company's fluorescent yellow color, which complemented the truck's blue-anodized parts. I also used GS Racing's blue-anodized, 7076, aluminum, flathead screws, washers and linkage stops. The aluminum screws were used sparingly on the chassis to fasten non-stress-related



Scott Bich painted the Pro-Line Chevy Silverado for the project. I'm sure you'll agree, it's the perfect finishing touch.



The Team Kinwald 1.5-degree rear axle carriers look good and are extremely strong. You can also see how the GS Racing J-type silicone coupler grips the exhaust header; this pipe will never fall off in the heat of battle.



The RPM Slingshot chrome wheels look beautiful installed on the truck. They actually add a little weight to the vehicle, but the extra weight helps out in the stability department during off-track play.

components such as the fuel tank and throttle/brake servo.

RPM* now offers neon yellow, long-shank (Losi) ball cups that look absolutely fantastic when installed on the chassis. The ball cups also seem to fit a little more tightly, and they remove all the play in the steering system. The ball cups are sold in packages of 12; I picked up an additional package to replace the ball cups on the steering link.

I also installed a complete set of RPM Slingshot chrome wheels; they're real showstoppers. The wheels weigh a little more than stock wheels, but the extra weight improves the truck's stability.

The final touch was the installation of Pro-Line's* Chevy Silverado body. It looks much nicer than the stock body and, thanks to the built-in air deflector molded into the back of the body, it provides improved engine cooling. The Bich'n Bodies* custom paint job makes this truck a serious concours contender, as well. I may not win the next race I enter, but at least I'm confident that my project truck will be a standout at the track.



To help prevent fuel foaming and smooth out the pulses of pressure from the exhaust, I coiled extra fuel tubing between the tank and pipe. The fuel tubing clips are from OFNA.

DRIVE-TRAIN UPGRADES

It's easy to discern the sound made by an improperly set-up slipper clutch or a loose diff on an electric vehicle, but noisy nitro engines mask those subtle sounds. I've seen many nitro racers melt the stock, molded diff gear because the diff was set too loose or it loosened during a race.

I decided not to take any chances; I replaced the stock diff gear with one of HG's alloy diff gears; I'll never melt this thing. While I had the tranny disassembled, I installed an HG titanium top gear to slightly lower the rotating mass. I also used the company's alloy diff nut in place of the molded unit. An ounce of prevention ...!

PARTS LIST

TRINITY/TEAM KINWALD ALUMINUM COMPONENTS:

- NXT shock towers—parts no. TK03001 (front) TK0201 (rear).
- NXT/GTX front bulkhead—TK0500.
- NXT/GTX steering link—TK2500.
- NXT/GTX 1.5-degree rear hub carrier—TK3501.

HAMMAD GHUMAN:

- NXT rear pivot support—2020.
- NXT/GTX front alloy steering knuckles—4130.
- NXT/GTX alloy diff gear—1847.
- NXT/GTX titanium top shaft—1102.
- NXT/GTX alloy diff nut—1800.
- Titanium ball studs—8311 (long), 8312 (short).

MIP:

- Onboard temperature gauge—3615.
- Boost bottle—3057.
- 2-N-1 clutch kit—3026.

RPM:

- Long shank rod ends (neon yellow)—73397.
- Slingshot chrome wheels—81843 (front) 81863 (rear).

GS RACING:

- Aluminum linkage stoppers—GSS01210BL.
- Aluminum countersunk washers—GSW00110BL.
- Aluminum flat-head screws (3 x 8mm)—GSS01408BL.
- J-Type silicone exhaust coupler (yellow)—GSMA15.
- Silicone switch cover—GSC0V01.
- Super-C silicone fuel tubing. (2x4.8mm/fluorescent yellow)—GS2048S/T.
- Nylon servo-saver (yellow/Airtronics)—GSS00820.

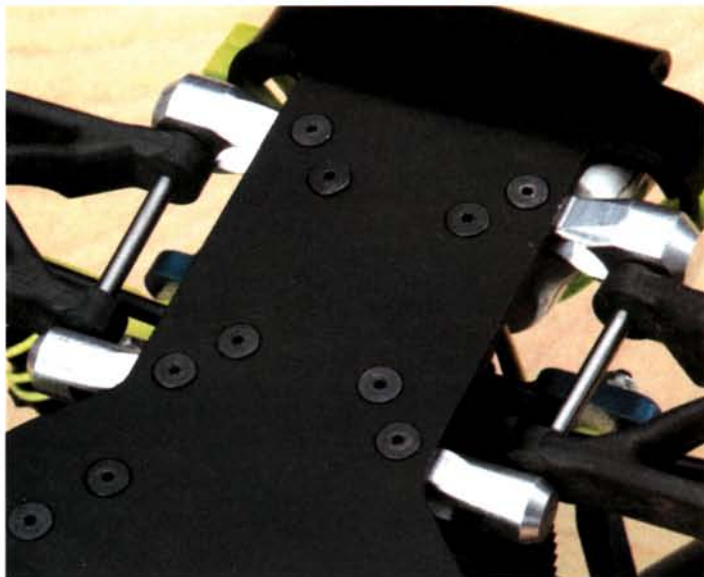
MISCELLANEOUS:

- Innoventive Technologies CVEC tuned pipe—HSS-100.
- O.S. *CV .12 engine.
- Team Associated/Factory Team* blue manifold (header)—7758.
- Trinity/Team Kinwald kingpin ball studs—TK5042.
- Progressive Suspension EDC-2 shock kit.—EDC-2010 (rear), EDC-2011 (front).
- Pro-Line NXT Chevy Silverado body—3086.
- Team Orion 1000 mAh, NiMH, 5-cell receiver pack—AT1002H.
- Airtronics 94157 (steering) and 94737 (throttle/brake) servos.
- Hitec Lynx 3D transmitter and DCX dual conversion receiver—123753.
- Motor Savers* 1/10-scale off-road air filter—MS0201.
- OFNA* fuel line clips—10270.
- Bich 'n Bodies custom paint.
- Lunsford 1.5 in. Punisher titanium tie rod (steering servo link).
- Team Losi 8-row, ribbed (silver compound) front tires—A7507S.
- Team Losi T-2000 (red compound) rear tires—A7641R.



Left: the HG steering knuckles definitely add to the truck's cool factor. Production units should be available now. I also installed Team Kinwald kingpin ball studs to help smooth out the steering and to make camber adjustment a little more convenient. Those RPM ball cups look great.

Right: check out the Hammad Ghuman machined-aluminum pivot supports; these things are bulletproof. They're also very convenient; you can quickly adjust rear toe from 2 degrees to 4 degrees by flipping the arm mounts over.



CLOSING COMMENTS

My Team Losi NXT is stronger than ever; I can drive the truck as hard as I want. The vehicle is nearly 5 ounces heavier than stock, but that's OK, too. The extra weight makes the truck handle better on slippery surfaces, and it also turns it into the track bully; go ahead and hack me ... I dare you! Granted, the hop-ups I installed on the vehicle are not all absolutely necessary.

But, next time I hit a board or fly off the track into somebody's pit table, the turn marshal will probably toss my truck back on the track and give me a thumbs up to confirm that it's still in one piece.

**Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■*

DuraTrax Real Race RC

How real is it?

by Peter Vieira

How much time do you spend tuning your car? I don't mean maintaining and repairing it; I'm talking about real tuning—you know, trying out different camber angles, roll-center settings, shock-fluid viscosities and so on. For that matter, how much time do you spend practicing? Chances are, you don't get to test, tune and practice as much as you would like to. It takes a lot of time and energy to try out new setups—not to mention the wear and tear on your equipment (which can include your full-size ride, if you have a long commute to the track).

By applying the lessons learned from the hugely popular Great Planes® *RealFlight* RC airplane simulator, DuraTrax® aims to bring authentic RC action to your PC with *Real Race*, a "professional RC car simulator." In addition to simulating the RC driving experience, DuraTrax has designed *Real Race* to function as the ultimate car-tuning and testing device. The software allows you to adjust all the performance parameters of a variety of on- and off-road virtual vehicles.

Without wearing out your wrench tips, trekking to the track, cracking open a bottle of shock fluid, or even getting out of your chair, you can test that stiff-spring, no-toe, lots of preload setup you've been thinking about, and fine-tune it, too. Then, when it works on the virtual track, you can apply it to your real car. At least, that's the idea.



PHOTOS BY WALTER SIGAS

WHAT YOU GET, AND WHAT YOU'LL NEED

You can forget about video-game-type controllers or keyboard control for *Real Race* (you don't drive your RC car with a keyboard or D-pad, do you?). DuraTrax includes a pistol-grip "radio" with the software package. If the unit looks familiar, it's because it's the old-style Futaba® Magnum minus the AM internals. The feel is authentic Futaba, however, and that contributes greatly to the feel of *Real Race*. A button on the side of the radio selects a dual-rate steering setting that is input during car setup.

The software is contained on a single CD, and "Quick Start Up" instructions are supplied along with more detailed installation and troubleshooting tips if your installation needs aren't met by the "quick" steps. DuraTrax also offers free tech support for registered users, as well as online help at www.realrace.com.

Here's what *Real Race* requires from your computer system:

- Windows 95/98 (Windows NT and Mac/Unix emulation boards are not supported).
- Microsoft DirectX-compatible graphics and sound cards.
- Intel Pentium 266 or equivalent processor (Pentium 300 or better for best performance).
- 16MB RAM (24MB best).
- 4X CD-ROM drive (16X best).
- Super VGA monitor.
- Microsoft Direct 3D-accelerated video card with 4MB or more video RAM (8MB best).

Simulator

SETTING UP THE TRACK

In addition to choosing and "designing" your own car, *Real Race* allows you to customize the track you choose. There are five of them:

- **Asphalt challenge.** This is a paved, on-road course that can also be run as a tri-oval.
- **Construction site.** This has plenty of elevation changes and a partially dug foundation area to test your technical skills, as well as some wooden ramps to jump.
- **Dirt bowl.** *Real Race's* off-road track looks tame but is actually quite challenging. It's patterned after Detroit's Freedom Hills track—home to the '91 off-road Worlds and the Kyosho Challenge events.
- **Parking lot.** This wide expanse of blacktop has painted lines but is otherwise obstacle-free. It's a good place to test on-road setups without worrying about navigating a track.
- **Pig pen.** *Real Race's* version of a vacant lot has lots of moguls, jumps, boards and debris to jump and bounce off.

Once you've selected a track, you can alter it by adding a driver, barriers, buildings, or a drivers' stand. The barriers are solid enough, but the other items are just for show; if your car "hits" a driver or a structure, it will pass through it undeterred. Traction can also be altered by moving the "Track Condition" slider between bad (least traction) and excellent (most traction), and "Track Height" adjusts the height difference between the lowest and highest portions of the terrain. The final

track parameters affect how you view the action; various PhotoField backdrops can be selected, including such scenic vistas as "Distant Hills," "Night Lights" and "Pendleton Station," among others. An auto-zoom feature can be toggled on or off (it's best to leave it on, so the computer automatically keeps the "camera" on your car), and atmospheric fog can also be added at the possible expense of frame rate.

SETTING UP YOUR CAR

Real Race includes 11 ready-to-drive vehicles from a variety of classes. To create your own vehicles, you must first copy and rename an existing car or truck to serve as the "canvas" for your creation. Don't worry; there are enough cars to suit any taste. Here's the lineup:

- **DuraTrax Axis, Nitro Quake, Maximum ST, Maximum BX**
- **Dazzler** (1/8-scale racing buggy)
- **Dirtball** (2WD .12 racetruck)
- **FastStrike** (2WD modified electric buggy)
- **Omega Force GS** (.26 4-stroke, "super" scale on-road, similar to a Kyosho SuperTen Four II)
- **Questor** (2WD modified electric racetruck)
- **Street Force** (.12 nitro 4WD touring car)
- **Xtacy** (modified electric 4WD touring car)

Performance mods abound, but *Real Race* also keeps aesthetics in mind by offering four paint schemes for each car.

Once your car is looking good and renamed to your liking, it's time to get down to the nitty-gritty. There are two ways to tune your car: Quick Car Edit and Full Car Edit.

- **Quick Car Edit** allows you to quickly (get it?) select tires, spring rate, maximum and minimum spring length, left



This is the first screen of the "full car edit" menu; from here you can click to menus for all the tuning parameters.

and right preload, wheel camber and toe settings, shock-oil viscosity, diff slippage, gear reduction, and radio settings, which include steering endpoints, servo speed, dual rates and exponential.

- **Full Car Edit** is where *Real Race* pulls out all the stops. There are separate menus for each sub-category of tuning options, and all of the following can be adjusted in metric or "standard" units, where appropriate:

- wheel alignment: includes camber, caster, toe angle, kick-up, left and right steering throw and wheelbase (30 inches maximum!).
- shocks: includes spring rate, shock-fluid viscosity, maximum shock length, maximum/minimum spring length, spring equilibrium length (length of spring set with minimum preload for zero sag) and left/right spring preload.

- tires: select any tire from another *Real Race* car, then edit its diameter (up to 10 inches), width (up to 10 inches), weight (1-ounce minimum) and offset (up to 5 inches).

- aerodynamics: includes frontal drag, downforce and side force on body, and the following wing parameters: size of top

IS IT WORTH IT?

Real Race isn't cheap. The best price you're likely to find it for is about \$150; for not much more cash than that, you can get some RTR kit-and-radio combos that will give you a real RC experience. You don't need a simulator to learn to drive an RC car; all you need is an RC car. If you have no RC gear and are considering buying *Real Race* instead of your first car, take my advice: just buy the car.

What *Real Race* will do is teach you just about everything you need to know about how and why a car handles badly or well, and you'll learn how to manipulate the car's settings to gain the driving feel you want. Yes; practicing on the *Real Race* tracks will help your skills stay sharp, but that's really just a bonus, in my opinion. The first, best benefit of *Real Race* is the education and understanding of RC car technology it promises, and the improved performance you'll see at the track when you apply what you've learned. That, to me, is well worth 150-or-so dollars.

IT'S COOL, BUT

I wouldn't consider these to be fatal flaws, but since DuraTrax plans to offer software upgrades to *Real Race*, I would place these on the top of the "to fix" list.

■ **SOUND QUALITY.** The Doppler effect is nice, but none of the cars sound realistic.

■ **LAP TIMER.** I'd like to see a post-race display of all the laps. This would allow you to discount those laps where you flipped the car or made a lot of mistakes, and concentrate on the consistent laps that truly reveal the effectiveness of your setup.

■ **RECONFIGURABLE TRACKS.** It would be nice if the layouts could be changed so I could duplicate the local club track. Even if *Real Race* only offered cookie-cutter jumps, straights and corners that could be digitally assembled like a slot-car track, that would be a step in the right direction.

and side areas, wing angle, fore/aft position, height.

—miscellaneous: includes inertia moment, center of mass offset (right, forward, up), brake force and total vehicle weight.

—suspension: includes vertical distance from chassis to lower shock bolt, arm length, hinge pin spread, offset from shock to axle, vertical offset of lower shock bolt to axle, up travel, down travel, static shock length, kingpin-to-hub offset, upper/lower shock-mount width and offset from arm plane to lower shock mount.

—differentials: includes center diff grease thickness (if the car is equipped with a center diff), diff type, grease thickness, slip-page and drive train friction.

—motors: includes number of cells (five to eight), battery type (1400 to 2500mAh), wind (12x2, 12x3, 14x2, 16, 17x2, 22x1, 27/24 stock, 27/36, basic 1+2) and motor

timing. There is also a View Performance key that calls up a virtual dyno with adjustable test voltage to chart the performance of the motor and timing you select.

—engines: includes fuel-tank size, fuel-consumption rate, sound profile, torque curve and engine type (.10, .12, .15, .21 or .26 4-stroke).

—clutch/transmission: includes settings for minimum rpm to partially and fully engage the clutch, 2-speed transmission (with settings for shift rpm, high gear reduction and primary gear reduction).

If you took the time to pore over that extensive (and still not totally complete!) list of what *Real Race* allows you to adjust, you probably noticed that some parameters that are adjustable on *Real Race*'s cars are not adjustable on your actual RC car.

DuraTrax seemingly wants to be sure that you have all the tools you need to replicate your current car in cyberspace. Although some important parameters—such as inner camber-rod positions—are missing, the dynamics they most affect are independently adjustable (in this example, the roll-center changes you might get with inner camber-rod position changes can be simulated by adjusting the car's inertia moments).

REAL RACING

I didn't get a chance to try *Real Race*'s Internet racing feature, with which you use the Web to host a race or join one already hosted by another *Real Race*r, but I did try the Solo Race option, which pits the driver against the clock. After a race, the computer displays the number of laps you turned in the allotted time, plus the time required to complete the lap in progress at the sound of the finish tone.

I drove all of the cars on all of the tracks (and yes, you can take the on-road cars onto the off-road tracks, and vice versa), and I found that *Real Race* truly nails the feel of the various RC types, from electric buggy to nitro monster truck. The physics and chassis dynamics feel "right," and the cars are as rewarding of good driving—and unforgiving of bad—as are authentic racecars.

THE VERDICT

Real Race very accurately simulates the feel of a high-performance RC car. However, it gets old pretty quickly if you just want to



The entire line of DuraTrax vehicles has been faithfully recreated by Real Race. This is the Axis, in flight over the Dirt Bowl layout.

goof around on the tracks. The driving areas aren't large enough for an element of exploration, and they cannot be reconfigured to make new layouts.

Ultimately, *Real Race* functions best as a training and testing tool for car tuning. With pop-up text to explain the function

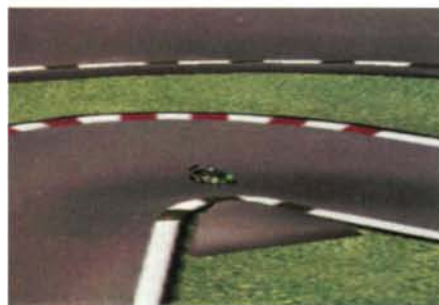
of each adjustment and the helpful tuning guide, *Real Race* makes it easy to see what each adjustment does, and then allows you to "feel" its effect on handling. The program allows you to try any type of setup you can imagine without spending hours at the bench. *Real Race* will help



The Construction Site track features wooden jumps; here, the Dazzler catches some air.

both seasoned drivers and new hobbyists better understand and exploit the capabilities of their cars.

*Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■



The Street Force tourer takes a tight turn on the Asphalt Challenge course.

RECORD A RACE

As this review was heading to press, DuraTrax announced a new downloadable feature that's available at www.realrace.com. Record A Race allows you to ... stay with me here ... record a race; once captured, the race can be replayed later. A friend with *Real Race* could send you his best laps, and you could then replay his race and put your car into the race and see how you compare. Likewise, you could record a race of your own and then race against yourself.

DuraTrax plans to make other upgrades available through realrace.com as users explore the program and suggest additions and changes. If you're thinking about picking up *Real Race* for your PC, you should definitely check out the site.

Up close: the Thunder Tech "tube"-frame Clod

Last month, I covered the NRCTPA Worlds, and as you may recall, one truck in particular gained a lot of attention when it was not allowed to compete in the tube-frame, monster-truck class. I squeezed in one picture of the notorious machine, but I'm sure you're hungry for more. Here's the inside scoop on Darren Grillo's Thunder Tech* racing chassis, which should be available soon (and will, he hopes, be made competition-legal by the NRCTPA).

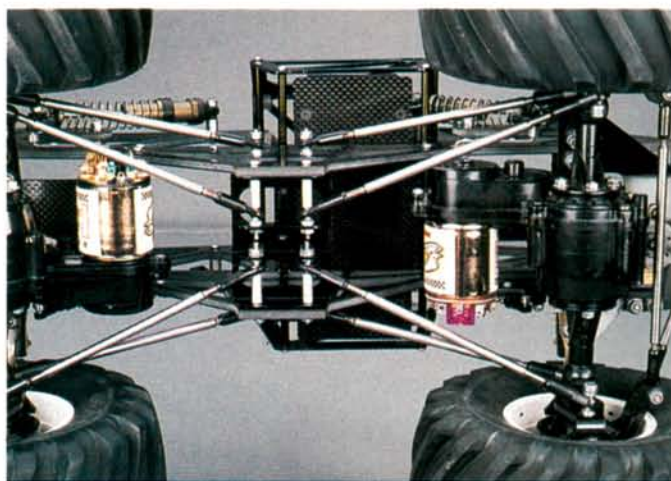
CHASSIS

The chassis is made up of two thick carbon-fiber side plates, joined by 14 aluminum standoffs. The plates extend slightly higher than standard chassis to form part of the cab. The cab section itself is sheet aluminum that has been cut and shaped to look like a roll cage. This is attached to the main frame with screws. Bending or breaking anything on this chassis will be tough! The two side plates

and the roll cage have been cut to appear as though they are constructed of separate tubes, which led to the "when is a tube frame not a tube frame" dispute at the Worlds.

SUSPENSION

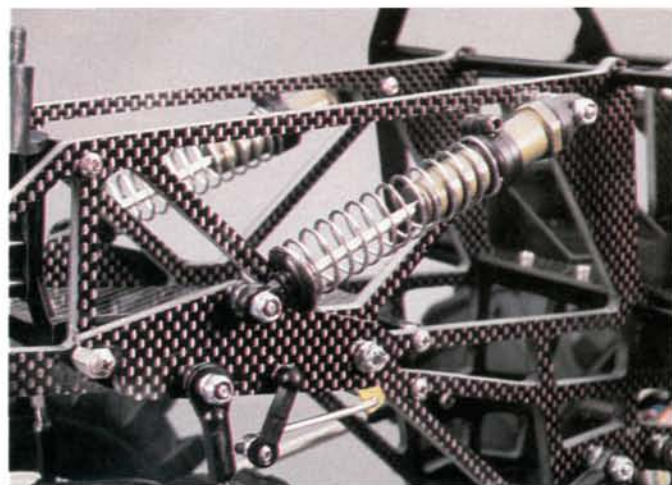
Four link bars and cantilevered shocks make up the suspension system. The stock 4-link suspension will use carbon-fiber rods. Optional titanium units will be



The bottom suspension arms are attached to the bottom of the chassis. To prevent them from breaking or bending, the screws are captured on each end.



It looks production ready, but this is a handmade prototype. Could this be the Clod chassis to beat?



The front and rear cantilevers are set up differently from other aftermarket companies'; the chassis has small standoffs that act as down stops for the shocks. The swaybars are also attached to the cantilevers instead of to the gearbox.

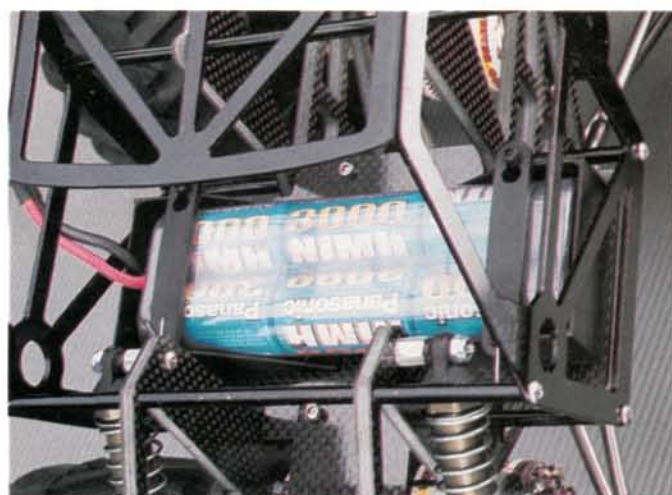
offered in short- or long-wheelbase form. The upper two links run from the outside of the chassis to the gearbox, while the lower arms run from the bottom center of the chassis to the gearbox. The long screws that mount the lower suspension arms are captured at both ends, eliminating the possibility of bending screws when the truck takes a hard hit.

The cantilevers have a unique design. They work very similarly to those on a real monster truck, where the suspension link is on the same side of the pivot point as the shock; the included Team Associated* shocks are also mounted in the upright position. A ball-bearing-supported pivot point makes for a smooth-pivoting cantilever. To prevent the shocks from bottoming out when the suspension is fully extended, each

cantilever has a stop. On most types of aftermarket chassis, the swaybar runs from the chassis to the gearbox. On this truck, the swaybars start at the chassis and end at the cantilevers; the swaybars are also fully adjustable.

OTHER STUFF

In the front and rear of the chassis is a small plate of carbon fiber. This can be used to mount the receiver, speed control, or both. The battery is mounted inside the roll cage running from side to side with two battery hold-down trays. A Parma* BigFoot body fits the frame, and Traxxas* body mounts hold it in place. The steering servo is held in place with a strong, aluminum servo mount that is secured in front of each gearbox. The rear steering has been locked out.



The battery is mounted inside the roll cage. It is easily accessed, and the Associated battery holders make it a snap to install and remove the battery.



Two small pieces of carbon-fiber plate sit between the chassis's frame rails. These plates provide a place to mount the receiver and ESC.



Check out this huge steering-servo mount. This heavy-duty unit looks as if it could take a hit from a nuclear bomb without bending.

SHOP TALK

I currently own a Kyosho USA-1. Is there any way to improve the suspension on the truck? I always see Clod Busters with killer suspension and chassis mods, but I never see them for my truck. Please help!

Joshua Leventhal
Cheshire, CT

Bennett Equipment* and Sassy Chassis* do offer aftermarket suspension and chassis kits for the USA-1. We are currently working on building these two kits to see how much they improve the stock truck. We will let you know what we discover as soon as we have finished the buildups.

If you have any problems or questions about trucks, or if there is something you would like to see in "4x4", email me at kevinh@airage.com or send your letters to:

"4x4"
RC Car Action
100 East Ridge
Ridgefield, CT 06877-4606 USA

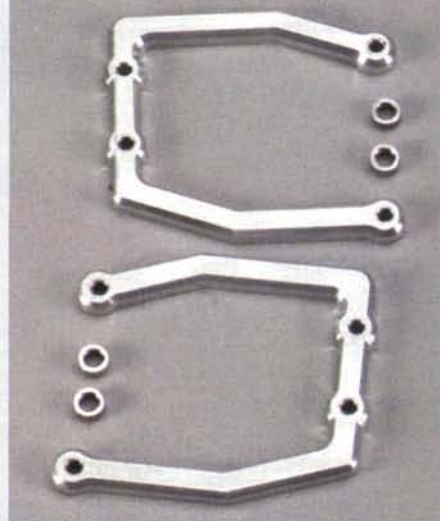


R/C Car Kings' Monsta-Foam monster-truck tire inserts

These inserts are designed to fit the Tamiya Clod Buster/Bullhead, Tamiya Juggernaut, Kyosho* nitro/electric USA-1 and OFNA* Blazer monster. They give the tires the added support they need to hold up the weight of most monster trucks. These inserts will prevent the tires from getting flat spots, and they will increase the traction of those big meats.

Part no.—RCK0200.

R/C Car Kings, (612) 895-9643.



CNC-machined bumpers for the Tamiya Juggernaut

New Era* produces these CNC-machined bumper braces for the Tamiya* Juggernaut (So what if it's discontinued? That makes it a legend!). The braces are constructed of strong 6061 T6 billet aluminum and are a direct replacement for the stock plastic bumpers. They can be polished or anodized to enhance the looks of the already stylish Jugg.

*Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■

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NiMH battery care and maintenance

by Steve Pond

Your top 10 questions answered

Shortly after the introduction of the Ni-Cd battery in the late '70s to early '80s, hardcore racers learned that rechargeable batteries have a certain "personality." To deliver maximum performance and longevity, batteries prefer to be treated in a certain manner. Each time a new cell is introduced, the arduous task of sorting out the treatment that will yield the best results begins all over again.

The introduction of the Panasonic 3000 NiMH battery almost a year ago set the research wheels in motion yet again. With these, an extra element comes into play—one that could make conclusive performance analysis a more lengthy process.

Ni-Cd batteries have always been varied, but they're all still Ni-Cds. The introduction of the NiMH battery eliminates that common Ni-Cd thread that permitted us to make certain assumptions about the characteristics of later generation Ni-Cd batteries. When analyzing NiMH batteries, we're starting from scratch.

For the latest information on the care and treatment of Panasonic's new NiMH batteries, I turned to Jim Dieter of Team Trinity. Jim probably has more experience with the new cells than anyone in the world (my words; not his). He has been involved in the testing and analysis of these new batteries since long before they hit the market, and his work as Trinity's motor and battery wizard at the world's most prestigious electric racing events continues. While Jim is quick to caution that he still has work to do before he can definitely say he has found the ideal protocol for the Panasonic batteries, he has already run more cycles through them than most of us will in 10 years.

The following are answers to 10 of the most commonly asked questions about the care of NiMH batteries.

1. Which amp rate should I use to charge the batteries?

After initial testing, Jim has settled in on a 5A charge rate for the Trinity team drivers. Though this is a little higher than the rate recommended for average users, he's comfortable that it doesn't harm the batteries. He has tested at higher rates (up to 9 amps!) but found higher rates unproductive.

As with all rechargeable batteries, higher charge rates work the cells harder. The higher rates don't appear to have any positive effect on performance, so stick to the lower rates; 3 to 5 amps is best.

2. Which type of charger should I use?

Almost any style of peak charger can be used to charge NiMH batteries, but caution must be exercised when using less sophisticated peak-detection chargers not specifically designed for NiMH batteries. Voltage peak chargers are designed to look for a certain voltage drop to indicate that a pack has reached maximum capacity. Ni-Cd batteries exhibit a greater voltage fluctuation during the charge cycle and a more noticeable voltage drop at the end of it. Chargers originally designed for charging Ni-Cd packs look for a comparatively pronounced voltage drop before they shut off the charger. NiMH batteries are more stable while being charged and demonstrate less voltage drop when full capacity has been

reached. This makes it harder for a Ni-Cd-type battery charger to know when a NiMH pack has peaked. As a result, some of the less expensive, non-adjustable voltage peak chargers will over-charge a NiMH pack.

3. I only have a mechanical timed charger. Can I use it to safely charge NiMH packs?

Yes, but use caution. Continuously monitor the pack's voltage with a voltmeter to determine when it's approaching a full charge, and vigilantly check its temperature. As soon as the pack starts to get hot (this happens rather quickly as it reaches maximum charge), remove it from the charger. It's a good idea to monitor the pack's temperature even if you do have a peak charger; as noted above, the charger can overcook your pack if it is "looking for" the deeper voltage drop of a Ni-Cd pack to indicate a full charge.

4. My charger has adjustable voltage peak detection; which setting should I use?

Chargers that have adjustable voltage peak detection should be set at 0.02 to 0.03 volt voltage drop (for the whole pack) before peak detection triggers and shuts off the charger. Jim has even tried setting his charger to 0.01 volt with good results, but he warns that such a low setting can lead to a "false peak."



Jim also reminded us that we should expect the NiMH batteries to be a little warmer than Ni-Cd cells when they've reached full capacity. When testing with a thermal peak-charger, Jim noticed Ni-Cds were at 35 to 37 degrees Celsius (95 to 99 degrees Fahrenheit) at full capacity, whereas the NiMH batteries were at 40 to 45 degrees C (104 to 113 degrees F). Keep in mind that this is the temperature as detected by the thermal probe, not by your hands. The actual temperature of the battery is likely to be a little higher. Thermal peak charging is a very useful alternative to voltage peak detection, as it simply looks for a significant change in pack temperature. It's an excellent charging method, though it would be wise to activate the maximum charge time function in chargers so equipped to act as a backup in case the thermal probe is accidentally separated from the battery pack.

5. Which charge mode should I use?

Many of the charge modes originally intended to increase the performance of Ni-Cd batteries are proving to be detrimental to NiMHs. Irrespective of the brand of charger, the results always appear to be better when the Panasonics are charged in a linear mode, meaning there is no programmed fluctuation in amp rates and/or polarity. The special charge modes don't seem to negatively impact run time, but the pack's voltage is slightly lower. Bottom line: use linear charge modes when using a charger that offers that choice (it's the default mode for most high-end peak chargers and the only mode available on lower-priced units).

6. Will trickle-charging help or hurt my NiMH cells?

Trickle-charging should be avoided when charging NiMH packs.

Most chargers default into a trickle mode when fast charging has been completed. This mode was designed to keep Ni-Cd packs at their highest voltage until they were used, but it seems to have a "flattening" effect on the Panasonic cells. If your charger's trickle-mode can't be turned off, just be sure to disconnect the pack from the charger as soon as it's peaked.

7. Should I re-peak my pack before a race?

Yes. For maximum performance, have the pack "peak" minutes before a race, stuff it into your car and go racing. However, using this method leaves no margin of error for a false peak; a safer approach would be to start charging about 1 hour before a race. This will leave 40 to 45 minutes to charge the pack, and you'll have an extra 15 minutes or so to remedy a false peak, if you need to. If all is well, then you can simply re-peak the pack prior to placing your car on the track. The ideal is to avoid letting the pack sit in a state of full charge for longer than necessary.

8. How should I discharge a NiMH pack after a race?

NiMH batteries seem to be far less sensitive to post-race treatment than Ni-Cds are. Trinity team guys discharge their packs by running them out in the car or placing them in a discharge tray. Their routine varies according to when a pack will next be used. If it will be used within a week, Jim recommends that you take it down to 0.9 volt per cell, or 5.4 volts in a 6-cell pack. He also says the rate of discharge doesn't seem to impact pack performance. NiMH cells don't have the same memory characteristics as Ni-Cds, so it seems less important to follow strict discharge guidelines. By whichever means necessary, bring the pack down to 0.9



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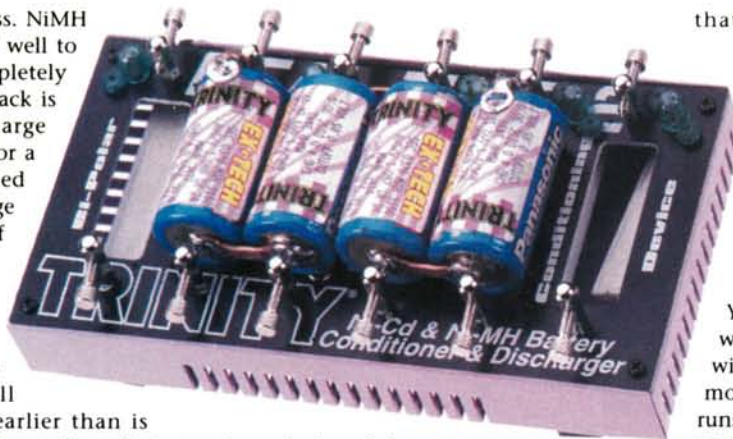
Serpent USA Inc. 2830 NW 79 Ave. Miami, FL 33122 Phone (305)639-9665 Fax (305)639-9658 E-Mail info@serpent-usa.com

volt per cell, but no less. NiMH batteries don't respond well to being stored in a completely discharged state. If a pack is at a nearly zero discharge state and is put away for a week, it can easily bleed off the remaining charge and reach dead zero. If the pack is allowed to bottom out, it could be harmed.

If a tray is your chosen discharge method, the pack will have to be removed earlier than is typical with Ni-Cds. Remember, discharge trays designed for Ni-Cds will bring voltage well below what's considered safe for NiMH batteries.

9. What about long-term storage?

If the batteries are to be stored for more than two weeks, Jim says it's wise to charge them to at least 50 percent of capacity. All rechargeable batteries lose their charge if left unused for long periods—a condition we already know isn't ideal for NiMH batteries. For lengthy storage, it's best that packs have a significant level of charge. A note for those who use battery "bugs," or cutoff devices: if they're designed for use with Ni-Cd batteries, they will discharge a NiMH pack to below a safe level. Seek out a device



that's intended to be used with NiMH packs. With all of the information already, it should go without saying—but I'll say it anyway—that you should never store packs with a dead-short lead.

10. Can I run a pack of NiMH batteries more than once a day?

Yes; in fact, it's recommended. After a week of being stored, a pack's first run will tend to be "flat," and it will develop more punch during its second and third runs. You simply need to let the pack cool completely before you recharge it. Even the Team Trinity drivers have run the packs two and three times during a day.

Jim Dieter still feels there's a lot more he would like to try before he is confident that the tips given here should be chiseled in stone. This is still a work in progress, and he may discover techniques that will get even more out of these batteries. Still, he has more experience in this area than anyone else, so even if there are still unexplored aspects of the care and conditioning of these new batteries, this is likely to be the best info available. Thanks to Jim and to Team Trinity for passing it along! ■

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#2603MS, #2605MS

SX-15 EV3
#2603, #2605

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- 1999 ROAR National Champion

www.serpent.com

Tamiya Pennzoil Nismo GT-R

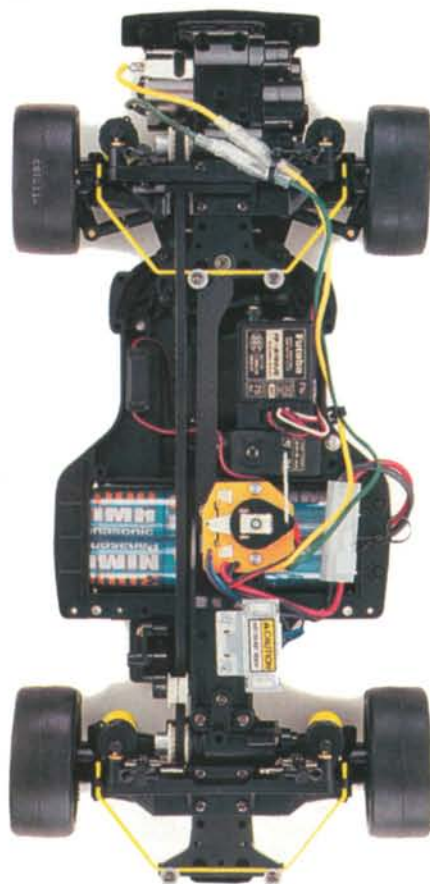
by Peter Vieira

"Yet another Tamiya* TA03F," I thought to myself when I scoped out the Pennzoil Nismo. As I checked out the box, I thought I was looking at Tamiya's usual "optional parts" artwork when the words "optional parts included" jumped out at me. Sweet! The Nismo kit includes

neoprene tire inserts, Type A belted tires, a full sealed-bearing set, yellow swaybars and springs, a low-friction drive belt and a graphite tub brace. If you plan to go racing with a TA03, get the Nismo kit with the hop-ups right in the box and save yourself a few bucks! Tamiya also offers this kit with a Raybrig NSX body, by the way.



LENGTH 4.5 in. (368mm)
WIDTH 7.25 in. (184mm)
WHEELBASE 10.19 in. (259mm)
WEIGHT 49 oz. (1,389g)



PERFORMANCE

The TA03F chassis isn't challenged much by the included mechanical speed control and 540 motor, but add a little horsepower, and the oh-three comes to life. With the additional hop-up parts Tamiya includes in this kit, the Nismo is racetrack-ready for any club event. Ball diffs would help it in tight turns, but otherwise, the swaybars, springs and tires effectively plant the car and let your skills shine through. If racing isn't your bag, but trick stuff is, then the included hop-up parts and ultra-scale body set will have you admiring the Nismo GT-R when it's on the shelf and reaching for it when you're ready to hit the parking lot.

**Addresses are listed alphabetically in the Index of Manufacturers on page 208. ■*

Required Accessories

- 2-channel radio.
- Steering and throttle servos (or electronic speed control).
- 6-cell, stick-type battery pack.
- Battery charger.
- Polycarbonate-compatible paint.

Features

- Front-motor 4WD chassis.
- Bevel-gear differentials.
- 540 motor and 3-step speed control included.
- Crisply molded, totally scale body and full decal set (as usual).
- Hop-up tires, belt, springs, chassis brace, bearings and swaybars included.



PHOTOS BY WALTER SIDAS

Pro-Max Activator

I recently began using a peak charger that is new to most hobbyists: the Pro-Max* Activator. This unit packs a lot of features into a package no larger than the typical budget charger; these include an LCD display, an adjustable charge rate and a cooling fan. Thorough instructions are also included, along with some useful adapters. Here are what the Activator has to offer and my notes on how it performed.

FEATURES

• **Digital display.** The Activator's display is operated by a single "mode select" button and cycles through the following "screens" with each press of the button:



This small fan pulls cooling air in through the small vents in the Activator's face plate.



indicate the voltage of the pack. As the pack charges, you can watch the voltage ramp up, giving a good indication of how close the pack is to peaking.

• **Charge amperage.** The Activator can charge at 0.5 to 6 amps, and the value is displayed with a single decimal value, as shown in the photo. Current is adjusted via a dial on the face of the charger.

• **Pack voltage.** As soon as it is plugged into the unit, the Activator's built-in voltmeter will

• **Peak voltage.** When the Activator detects a peak charge, it saves the peak voltage in memory until the pack is disconnected. No voltage is displayed while the pack is charging (use the "pack voltage" mode to view voltage while charging is in progress).

• **Charge time.** As soon as charging has begun, the timer counts the minutes until the pack peaks. After the charge is complete, the timer will hold the total charge time until the pack is disconnected.

Continued on page 192

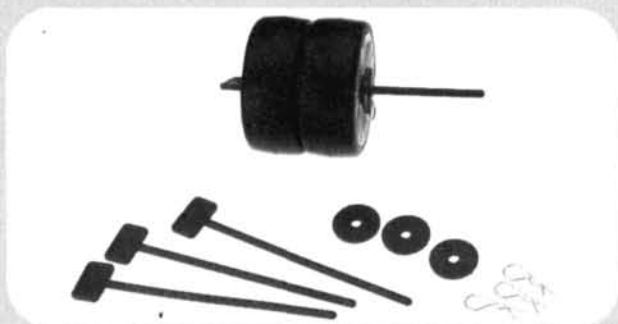
MANUFACTURER'S SPECIFICATIONS

Cell compatibility	Ni-Cd, NiMH/50-2000mAh, one to eight cells
Charge type	linear
Amperage range	0.5 to 6
"Slow" charge rate	200mAh
Trickle-charge rate	100mAh
Peak detection	delta (voltage drop)
Input	AC/DC
Supplied output connectors:	JST ("Tamiya"); female JST adapter; glow-starter adapter; insulated alligator clip adapter
Supplied input connectors:	AC plug; DC spring clips; automotive cigarette lighter adapter

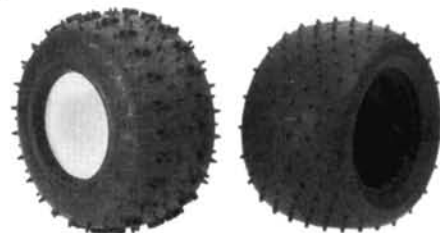
DuraTrax Tire Sticks

You have a bunch of sedan slicks, and they all look the same. So, which ones are a matching set? Store your TC tires on DuraTrax's tire sticks to prevent mix-ups in the pits. The sticks come in packs of four, and each holds up to four mounted touring car tires.

Part no.—DTXC2585.
Price—\$2.49.



OFNA Racing Mini Spike and X-Pin 2.2 truck tires



OFNA* has added two types of 2.2 truck tires to its gigantic stock of products. The Mini Spikes (right) are offered in a single soft compound and look as if they might hook up on packed tracks, but for the best results, you'll need to pick up some foam inserts. The X-Pin (left) is more of a "fashion" tire. There aren't any internal webs in the carcass to support the thin rubber tread, and the tread pattern is definitely "old school." Ironically, the X-Pins do include foam inserts; they're the strip type, so you'll have to glue the ends together before you install them.

Mini Spike truck tire—87001, \$11.95.

X-Pin truck tire—87155, \$12.95.

• **Overload protection.** The 10A automotive fuse will blow if the charger is overloaded, so Pro-Max includes one spare fuse. However, it does not have reverse-polarity protection.

• **Adjustable charge amperage.** A dial in the face of the unit sets amperage in 1/10-amp increments.

• **"Slow peak" mode.** The Activator can charge single cells with capacities as low as 50mAh with this function, which charges at 200mAh. All of the Activator's other features (except adjustable amperage) remain functional in this mode.

• **Plenty of adapters.** The Activator is equipped with a male Tamiya plug, the industry standard for stick packs. Pro-Max also includes an adapter for "old Kyosho"-type packs that use a male Tamiya connector, as well as a pair of alligator clips for packs without connectors.

• **AC/DC operation.** Most users will simply plug the Activator into an AC wall outlet, but clips are provided for DC hookup to an automotive-type battery or other power supply. A clever adapter is also provided that allows the Activator to be plugged into an automobile's cigarette lighter.

• **Cooling fan.** More chargers should include this feature. A small internal fan prevents the Activator from going nuclear under reasonable conditions. The fan operates continuously as long as the Activator is powered.

• **NiMH compatibility.** Pro-Max says that the Activator will charge Ni-Cds or NiMH packs, but only those up to 2000mAh. Since sub-C NiMH cells are 3000mAh, they are officially off the list. However, I plan to test the Activator for 3000mAh NiMH compatibility anyway!



These adapters are included with the Activator, enabling you to charge just about anything.

TESTING THE ACTIVATOR

Operating this charger is a snap. After you press the red "start" button, the green "charge" light and red "test" light blink for about 10 to 15 seconds while the charger tests the battery to make sure it doesn't have a

Likes

- Easy operation.
- Three different charging connectors.
- AC/DC operation.
- Digital screen readout.
- Built-in cooling fan.

Dislikes

- Cooling fan can be overwhelmed by back-to-back charging.
- No reverse-polarity protection.

short or a bad cell. After the lights stop blinking and the green stays solid, adjust the current to the desired amperage; then sit back and relax. When the pack has peaked, the Activator beeps loudly three times to let you know it has finished charging. After the charger shuts off, it automatically goes into trickle-charge mode at 100mAh; the green LED blinks to let you know it's in trickle mode. The steps are the same for "slow peak" mode, but

slow-peak function must be selected before the pack is connected.

When I put the charger through its paces, it performed very well. I charged two, 6-cell 3000 packs, two, 6-cell 2000 packs and a 4-cell, 1700 pack, one after the other, with no

false peaks or blown fuses; how-

ever, the Activator was quite hot after I charged the third pack (I'm sure it would have been much hotter without the fan). I let the charger cool down for 10 minutes (the fan helps to cool the charger quickly) and finished the rest of the test packs without a problem. For the record, I charged the unmatched, 3000mAh stick packs at 3.5 amps; the Activator finished each off in 32 to 33 minutes with a peak voltage of 9.1 to 9.3 volts and left the packs slightly warm to the touch.

In an attempt to "fool" the charger, I made up a 6-cell pack with one bad cell; the Activator's test function must really work as advertised, since it refused to charge the pack. I also tried hooking up a pack in reverse, a "mistake" the test function did not catch. To its credit, the Activator did not suffer any ill effects from the experiment, but it undoubtedly would damage the pack to let it continue to charge with the reversed connection.

After charging a number of additional packs and experiencing nothing but reliable operation, I can recommend this charger with confidence to anyone who wants a full-featured, adjustable peak-charger at any price, but the Pro-Max Activator should be particularly attractive because of its low price (around \$100).

—Robert Allgeyer



IRS Silicone Diff Lube

Make differential building neat and easy with IRS diff lube in a needle-point syringe dispenser. Just a little of the slippery lube can easily be applied to the differential ball; when you're finished, seal off the needle by twisting the tip of the syringe. IRS packs a ton of quality diff lube into the syringe, so there's no excuse not to have a freshly rebuilt diff.

Part no.—IRS210.

Price—\$4.

Olfa Circle Cutter

If you've ever seen the instruction sheets that are included with HPI's bodies, this will be a familiar tool. The circle cutter will cut a perfect wheel well every time without nibble marks or scratched paint. The tool can be adjusted to cut holes up to 6 inches in diameter, and it even has built-in storage for spare blades—which are included! One tip: mask off a "window" in the wheel wells so you can line up the circle cutter's pivot leg with the wheel nut. That way, you'll be guaranteed a spot-on wheel-well location

(if you have an HPI body, just use the molded-in dimple that indicates the center of the wheel well). Check your local art-supply store for Olfa products, or order direct by calling (800) 457-2665, Ext. 11. Part no.—CMP-1. Price—\$15.



Keyence A-01B Infinity ESC

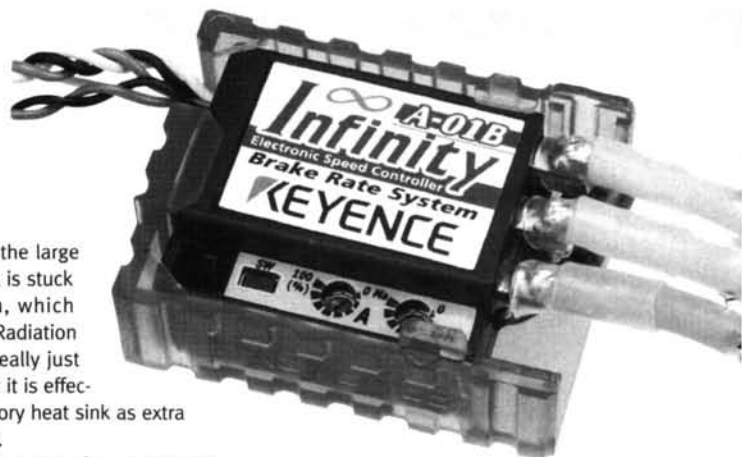
Were it not for the "Infinity" decal, you'd never guess that this is a new Keyence* ESC; it looks just like the A-01 Professional I reviewed in the July '99 issue. Rest assured though—there's new stuff crammed into the tiny case, all designed to help you turn faster laps. Here's what the Infinity can do:

FEATURES

- **Current limiter.** The Infinity uses the classic potentiometer-type current limiter, which can be set from 100 percent (off—no limiting) to zero. The limiter is not "smart," however, and if it's set too low, it will limit motor speed.
- **Adjustable brake rate.** This feature replaces the Professional model's current-limiter-timer function. Brake rate is simply the Infinity's minimum brake setting. When set to the minimum position, the brake is linear. As the brake rate (Br) dial is turned toward "Ma" (for "maximum," presumably), the amount of brake that the Infinity will apply as the least possible amount is increased. At the max setting, the Infinity will deliver 70 percent of its total braking power the moment the throttle trigger nudges the brake position.
- **Pushbutton setup/Dash Power Mode.** In addition to matching the Infinity to your radio, the Infinity's setup button activates the Dash Power Mode (hold down the button until the LED flashes, then let it go until it's solid). Dash Power overrides the current limiter setting so you can blast off the line with full power. As soon as the trigger returns to neutral, or if brake is applied, the Infinity activates the current limiter setting. If the current limiter is already set for 100 percent, the Dash Power Mode isn't a factor.
- **Heat sink.** There are no external FET tabs to clip a conventional heat sink onto, so Keyence supplies a stick-on heat sink that replaces the Infinity's name-

plate. Keyence refers to the large metal plate the heat sink is stuck to as its MPRS system, which stands for "Metal Plate Radiation of Heat Structure." It's really just an internal heat sink, but it is effective. Consider the accessory heat sink as extra insurance, but not critical.

- **Protective case and accessories.** Keyence's unique, snap-on armor case is included, as are capacitors, a Schottky diode, a setup tool (you'll



MANUFACTURER'S SPECIFICATIONS

Input voltage	6 cells
Weight	18g
Dimensions	30.6x26.1x13.1mm
FETs	16
On-resistance	0.0006ohm
BEC volts/amps	5.8/1
Motor limit.....	7 turn
Frequency	2930Hz

Likes

- Tiny size is great for cramped chassis.
- Smooth, cool and reliable.
- External solder tabs project from sides of case to help prevent melting wires when changing them.

Dislikes

- The included lime-, mango- and salmon-colored wires are hideous.
- Difficult to press setup button without the included tool.

need it; the setup button is recessed and it is teeny-tiny), mounting tape and a spare nameplate. Complete English instructions are also included.

PERFORMANCE

I tested the Infinity in my Kyosho* TF-4 with a 13 double. Installation went quickly, thanks to the pre-soldered motor and battery leads. External mounting posts make it easy to replace the wires (which I was tempted to do even before installation of the Infinity, since its neon-colored wires are ugly as sin). There were no surprises; setup was simple, and throttle feel was very linear and smooth. I discovered that setting the current limiter too low reduced top speed, but that's hardly a problem, especially since I rarely use a current limiter.

Dash Power Mode works as promised, as does the adjustable brake rate feature. However, I doubt that I'll use either feature very often; I'm usually too ham-fisted with the brakes, so higher minimum brake settings would hurt more than help me. That's just my call; if your track has fast straights that dump into tight hairpins (and there's plenty of traction), experiment with minimum brake rate.

Like the A-01 Pro I tested previously, the A-01 Infinity stays remarkably cool even after long runs, and it has proven reliable. It's a good racing ESC and certainly worth adding to your list if you're in the market for competitive electronics.

—Peter Vieira

*Addresses are listed alphabetically in the Index of Manufacturers on Page 208. ■

OFNA/Picco P-7S Glow-plugs

Glow plugs don't look like much, but they can really cramp your lunch budget; good plugs can cost as much as \$10 each! OFNA offers a 5-pack of individually carded, high-quality Picco P-7S plugs at a very reasonable price. The blister packs keep pit-box crud out of your plugs and guarantees the gasket washer won't get lost before you even install the plug. Part no.—51057. Price—\$23.95.



HPI Aluminum brake block and

gear-shaft mount for Nitro RS4 series

These purple-anodized, machined-aluminum widgets from HPI Japan replace the molded gear-shaft mount and brake block of any HPI Nitro RS4 vehicle and are a direct fit. For increased rigidity and enhanced appearance, just unbolt the plastic stuff and bolt in the purple parts. Since normal distribution channels would have increased the price of these Japanese-market hop-ups, HPI is only offering them direct (for \$28 each, rather than \$50!). If you'd like to snag a set, click over to www.hpiracing/buyhpi.htm.

Aluminum brake block—72061; aluminum gear-shaft mount—72068. Price—\$28.



TRACK TEST Mugen MTX-2

Continued from page 58

Protoform* 200mm Accord body to top off the MTX-2. I feel little difference in handling between the two and am comfortable racing with the Accord. I painted the body with Parma* Faskolor paints; cool, huh?

PERFORMANCE

The Mugen's NovaRossi engine was very tight, so I broke out my modified starter box to turn it over. My starter box consists of two AstroFlight 6-turn drag motors and two, 2000mAh battery packs wired in series. I don't fool around!

The included Mugen MT12 engine is snappy and has lots of power through the power band. For a unit with a cam-style clutch, the 2-speed shifted very smoothly and didn't tweak the car when second was engaged.

That's all great, but how does it handle? I set up the car with some of the settings from the manual and some from the set-up sheet. All of the camber angles and ride-height adjustments were taken from the set-up sheet; the shock positions and rear tie-rod location were taken from the manual. The MTX-2 ran well on the test track. It absorbed the bumps without getting out of shape, and I was able to keep the car at an acceptable speed through the corners. But a small push wouldn't let me corner the car hard.

Back to the pit table. I set the car up according to the included set-up sheet and returned to the track. I immediately noticed a huge increase in power steering and stability. The MTX-2 was begging to be driven hard. Earlier, when cornering, I found myself letting off the throttle too much. The car's previous handling would hold the corner, but I couldn't tighten it up and hit the apex of the corners. I re-adjusted my driving and stayed more on the throttle through the corners with the new setup and pulled the trigger hard out of the exits of the turns. The car just plants itself and reacts to every command.

I really recommend trying to stick with the stock setup. Tracks will vary and changes will have to be made, but it is an excellent starting point. The stock tires have definitely got to go. Save yourself some time and buy racing slicks right from the get-go. A hard insert is good to use in the front. This car has so much steering when dialed to the setup sheet that you actually want to get the front to push a little with hard inserts.

THE VERDICT

There is very little to dislike about this kit. The tires aren't competitive, the chassis edges are sharp, the center belt is a little sloppy, and I feel adjustable rear tie rods should be standard, but that's it for complaints. The MTX-2 is a solid, durable and,

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WANTED: Tamiya Leopard A4. Call Frank, (902) 469-3989. [6/00]

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FOR SALE: TRX-3 buggy, RC10ST w/upgrades. Great condition, barely used. (515) 473-3285; afish01@ibm.net. [4/00]

WANTED: old Tamiya RC cars, trucks. Built or kits. Scott, (619) 588-9813. [5/00]

EVENTS

12th APRIL FOOL'S CLASSIC: April 1 and 2. Intermountain R/C Raceway, Utah. (801) 250-8303; fax (801) 768-1987; email rcmother1@aol.com. [4/00]

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Millmay, NJ 08340;
phone/fax (609) 476-2371.

Keyence

distributed by GHI, 2374 North
Orange Mall, Orange, CA 92865;
(714) 921-0322; fax (714) 921-
0380; www.keyence.co.jp.

KO Propo USA Inc.

16012 South Western Ave., Ste.
308, Gardena, CA 90247; (310)
532-9355; fax (310) 532-9354;
www.kopropo.co.uk;
info@kopropo.com.

Kyosho/Great Planes Model Distributors

P.O. Box 9021, Champaign, IL
61826-9021; (800) 682-8948.

Loctite Corp.

18731 Cranwood Ct., Cleveland,
OH 44128; (216) 475-3600;
customer service (800) 338-9000.

MIP

830 W. Golden Grove Way,
Covina, CA 91722; (626) 339-
9007; fax (626) 966-2901;
www.miponline.com.

Model Rectifier Corp. (MRC)

80 Newfield Ave., Edison, NJ
08818-6312; (732) 225-6360;
fax (732) 225-0091;
www.modelrec.com.

Motor Saver

24282 McCoy Rd., Lake Forest,
CA 92630; (714) 455-0201;
fax (714) 456-0249.

Mugen Seiki Racing Ltd.

19771 Sky Park Cir., Ste. G, Irvine,
CA 92614; (949) 475-9505;
fax (949) 475-9511.

New Era Models

P.O. Box 7378, Nashua, NH
03060-7378; (603) 888-4453;
fax (603) 888-8645.

Nuova Faor

distributed by Ace Hobby
Distributors.

OFNA Racing

22692 Granite Way, Ste. B,
Laguna Hills, CA 92653; (949)
586-2910; fax (949) 586-8812;
www.ofna.com.

Omega

(engines); distributed by Ace
Hobby Distributors.

Orion

see Team Orion.

O.S.

distributed by Great Planes.

Parma/PSE

13927 Progress Pky., North
Royalton, OH 44133; (440) 237-
8650; fax (440) 237-6333.

Progressive Suspension

11129 G Ave., Hesperia, CA
92345; (760) 948-4012; fax (760)
948-4307; www.
progressivesuspension.com.

Pro-Line/Jaco

P.O. Box 456, Beaumont, CA
92223; (909) 849-9781; fax (909)
849-2968.

Pro-Max

distributed by Global Hobby
Distributors.

Protoform Inc.

P.O. Box 456, Beaumont, CA
92223; (909) 849-9781;
fax (909) 849-2968.

Robinson Racing Products

4968 Meadow View Dr.,
Mariposa, CA 95338; (209) 966-
2465; fax (209) 966-5937;
www.robinsonracing.com.

RPM Inc.

14978 Sierra Bonita Ln., Chino,
CA 91710; (909) 393-0366;
fax (909) 393-0465.

Sassy Chassis

1932 22nd Ave., Kenosha, WI
53140; (414) 551-8536;
fax (414) 551-8566;
www.sassychassis.com.

Tamiya America Inc.

2 Orion, Aliso Viejo, CA 92656-
4200; (800) TAMIYA-A; fax (949)
362-2250; www.tamiya.com.

Team Associated

3585 Cadillac Ave., Costa Mesa,
CA 92626; (714) 850-9342;
fax (714) 850-1744;
teamassociated.com.

Team Kinwald

distributed by
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Team Losi

13848 Magnolia Ave., Chino, CA
91710; (909) 465-9728;
fax (909) 590-1496;
www.teamlosi.com.

Team Orion Inc.

15311 Barranca Pky., Irvine, CA
92618; (949) 864-1720;
(949) 864-1722;
www.team-orion.com.

Thunder Tech Racing

1904 Wisteria Ct., Unit #1,
Naperville, IL 60565; (630) 428-
1276; fax (630) 428-1683.

Thunder Tiger USA

distributed by Ace Hobby
Distributors.

Tower Hobbies

P.O. Box 9078, Champaign, IL
61826-9078; (800) 637-4989;
fax (800) 637-7303;
www.towerhobbies.com.

Traxxas Corp.

12150 Shiloh Rd., #120, Dallas,
TX 75228; (972) 613-3300;
fax (972) 613-3599;
www.traxxas.com.

Trinity Products Inc.

36 Meridian Rd., Edison, NJ
08820; (732) 635-1600;
fax (732) 635-1640;
www.teamtrinity.com.

TTR

distributed by
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Chris's BACK LOT

The opinions expressed on this page do not necessarily represent the opinions of the entire *Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. My email address is: chris@airage.com.

BY CHRIS CHIANELLI

Trust your senses

Chris,

I know you're busy, so I'll try to make this short. I recently bought an OFNA P4 force engine (.21) and need some help breaking it in. The instructions are not that clear, but I think they go something like this: the main needle valve is to be set 3 turns out, the supply needle 2½ turns out, and the idle set so there is a 1mm gap when the throttle is at neutral. You should then run the engine through three tanks of fuel with these settings at low rpm with short speed bursts. Finally, you should lean out the main needle an ⅛ turn at a time, waiting at least 30 seconds between adjustments until you obtain snappy throttle response with plenty of smoke and a little unburnt fuel and oil coming out of the exhaust stinger. The instructions did not tell how the supply needle should be adjusted, but does this sound right to you? Also, how should I adjust the carb if I switch to 20-percent nitro (I'm running 10-percent in it now, with 18-percent lubricant). I also bought some long glow plugs that have an idle bar, but the engine manual said to use a glow plug without an idle bar. Will I damage the engine if I use these? One more question: the truck I have is a monster blazer; should I cut a hole in the front window for cooling, or not?

TODD

Todd, it sounds to me as though you have a pretty good basic understanding of things, but here's the most important thing to remember: every engine is different. Even two engines of the same model from the same manufacturer can differ slightly. Any number of turns to open the needle—whether high- or low-end—

that is suggested in the instructions, or even in the pages of *RC Car Action*, is intended only as a starting point to get the engine running. Slight differences in production tolerances from engine to engine, as well as humidity, temperature and fuel, will dictate slight differences in needle settings. Learn to rely more on your eyes and especially, your ears, to correctly fine-tune a glow engine. The only thing I can add to what you are already doing is

to suggest that the first time you run an off-road car with a new engine, you do so on pavement, not dirt. Pavement's lower rolling resistance will help keep the new engine's temperature down. Also, if possible, try to do your breaking-in when the weather is dry; high humidity makes alcohol engines run hotter.

As to your 10-percent-versus-20-percent-nitro question, the higher nitro will definitely affect the needle setting. Twenty percent is good, but I don't recommend going any higher. Anyone who thinks high nitro is going to win a race for him also probably believes professional wrestling is for real. Nitro can be a double-edged sword. Twenty-percent will allow good power delivery with a richer needle setting than will 10 percent. This will, however, also tempt you to tweak higher rpm from the engine, and that can lead to overheating. The 20-percent nitro will give better throttle response in many engines and often improves idle. And about the idle bar—forget it. We don't use those in RC cars. And yes, cut that hole in the windshield.

Good luck, Todd, and remember: smooth driving—not top-end speed—wins races. —CC

Sherri is in love

Here's a picture of Sherri Williams' T3. As you can see, she really puts her heart into racing. She states, "I've only been racing for about one year, and I'm hooked! RC car racing is the best ever—no substitutes!

I'm also the first female to win a trophy in my area." As I understand it, the competition is pretty stiff in Sherri's area of Texas. She has seen the 4-stroke engine perform and states, "I'm in love!" I guess that will be her next project. Don't forget to send me a photo, Sherri.

The best to you,
Chris

P.S. By the way—the first page Sherri goes to in each issue is "Chris's Back Lot"; I love that.

